April 24, 1939

STEEL

DUCTION • PROCESSING • DISTRIBUTION • USE

ESTABLISHED 1882

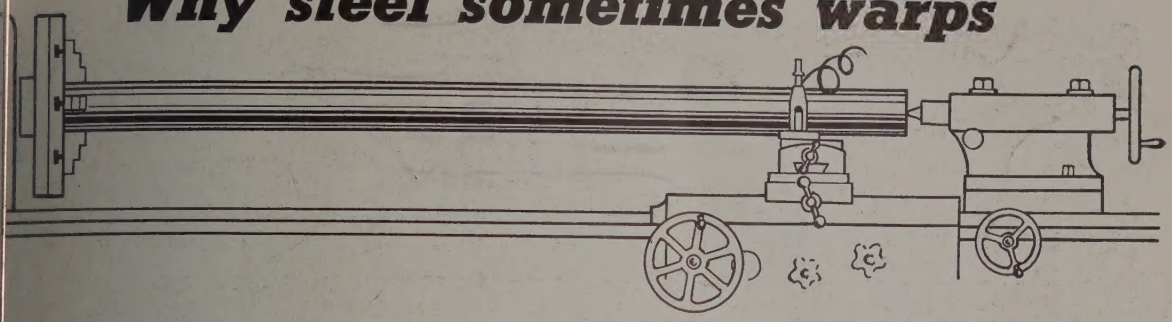
Whitey Sez:

"Nothing dispels fatigue quite so well as a sprinkling of soft music . . . Liberating a few notes throughout the shop puts rhythm in the soul and unties craftsmanship into your Electrodes."

MAURATH, INC. BUILDER OF [illegible] WELDING ELECTRODES IN ALL ANALYSES

CLEVELAND

Why steel sometimes warps



tress-relief anneal will usually prevent it

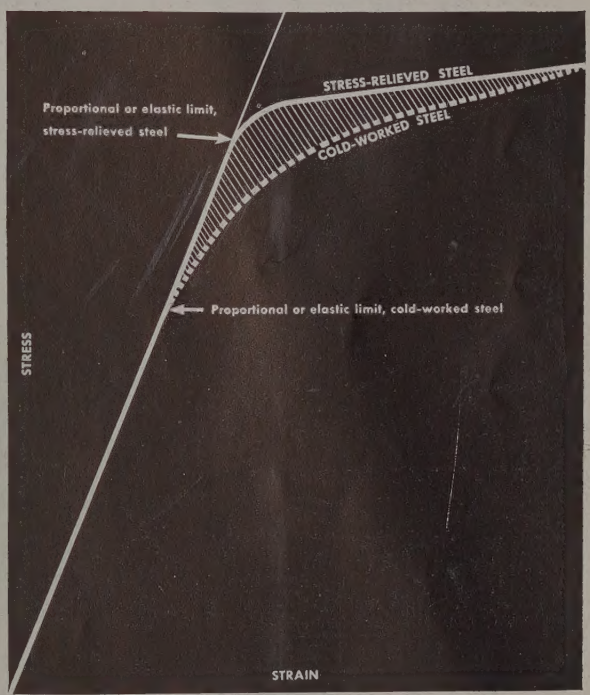
ROM time to time machine shops complain of warpage or distortion when machining steel stock. This is usually noticeable only when part is long. It occurs on "as-rolled" or heat-ated bars which have been machine straight-d and on cold-drawn bars, especially where -ways are cut. The harder or stronger the ma-al, the more likelihood of trouble.

use. The cause is not a defect in the metal, but ner stresses set up within the steel by straining eyond its elastic limit. Machine straightening ar will do this, as will cold forming or cold wing. Even the cold working that the steel ives by heavy machine cuts may be the cause uch warpage.

nedy. The remedy is to relieve such stresses ore machining (or between machining opera-s, if heavy cuts are taken). This can usually ccomplished by a low-temperature or stress-ef anneal.

uch an anneal will usually be carried out at a perature between 800 and 1100 deg. F. Obvi-y, on quenched-and-tempered parts, the tem-ature should be held approximately 100 deg. F. w the tempering temperature to avoid soften-the steel.

cts of this sub-anneal. A stress-relief anneal have no harmful effects on the steel. To a ted extent it may improve the physical prop-



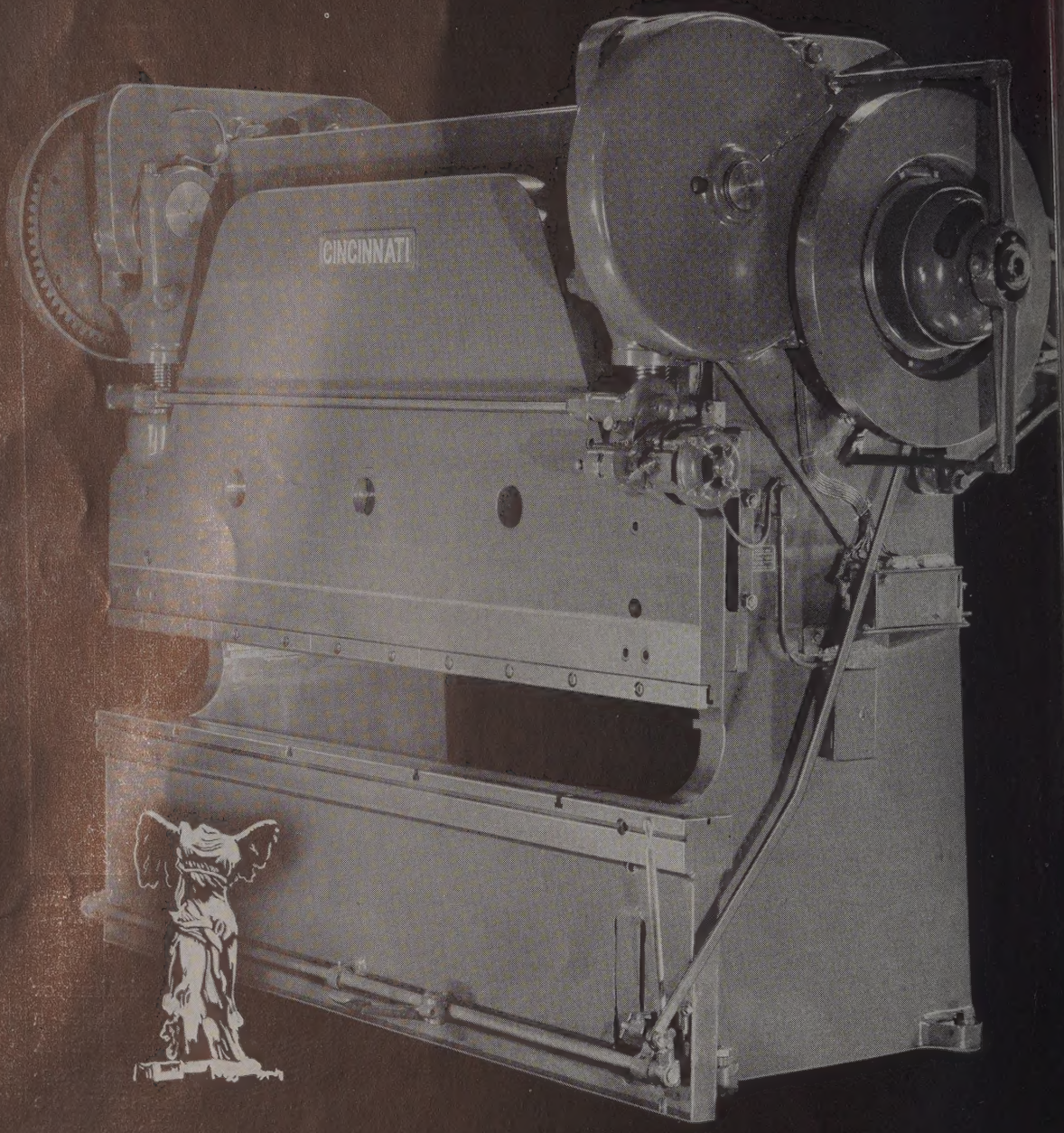
Effect of stress-relief anneal (shaded area). It raises the elastic limit without noticeably affecting yield point or tensile strength

erties. Note the curve above. The elastic limit, or point where the stress-strain curve leaves a straight line, is lowered by cold-working steel. A stress-relief anneal will raise this point until it approaches the yield point. Little difference will be noticed either in yield point or tensile strength. Ductility, if changed, will be improved.

Metallurgical advice. A call to the nearest Bethlehem office, or a letter to Bethlehem Steel Company, Bethlehem, Pa., will bring metallurgical advice on this or other subjects. To make use of this service places you under no obligation.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL



Parts just naturally fit together when formed on Cincinnati Press Brakes • • • •

Write for descriptive literature.

THE CINCINNATI SHAPER COMPANY, CINCINNATI, OHIO

SHAPERS • SHEARS • BRAKES

PICTURE OF A MAN

LASHING HIS PLANT'S ASSEMBLY COSTS 50%

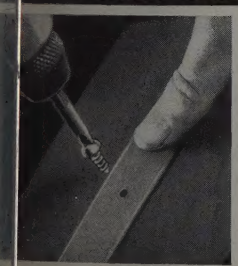
Many a manufacturer thought sing Phillips Recessed Head ws from seeing them on auto- les, aircraft, electrical applian- urniture, lawnmowers—bear- he names of firms which are us for insisting on *both qual-* nd *most efficient methods* anufacture.

Patented Phillips Recessed d Screws are priced somewhat er than slotted screws but the ngs in assembly costs more offset the difference in price. your product's sales appeal creased. Remember, the Phillips w — a stronger, burrless, more attractive ning—is fast becoming a mark of *quality* manufacturing!

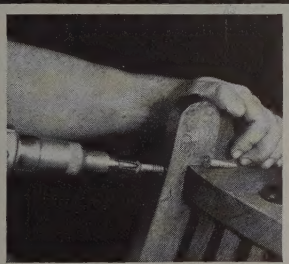
THIS VALUABLE BOOKLET

shows how you can make savings in assembly cost immediately. Describes use of Phillips Screws in many industries — examples of large savings in production cost. Address one of the firms below for free copy.

OW YOU CAN SEE WHY ASSEMBLY MEN TURN OUT FASTER, BETTER WORK



hillips Recessed Head Screw to the driver — no fumbling. ward places easy to reach. Note r driver — no danger of acci- caused by slipping driver.



One hand drives—other hand steadies the work. The Phillips Screw automatically goes in straight. Triple contact of Phillips driver and screw-head makes driving easy.

Phillips Screws set up flush without split head. Improved appearance. More holding power—often fewer or smaller, lower-cost sizes are used.

STRENGTH OF HEAD DUE TO SHAPE OF PHILLIPS RECESS. Taper and depth of Phillips recess carefully worked out to utilize driver's *maximum* turning power—without sacrifice of strength in screw head. Flat surfaces—no sharp corners; so no burring. 4 sizes of Phillips Drivers provide greatest efficiency for all Phillips Screw sizes. 2 sizes fit diameters #5 to #16 inclusive.

PHILLIPS *recessed head screws*

MACHINE SCREWS · SHEET METAL SCREWS · WOOD SCREWS · STOVE BOLTS

U. S. Pat. on Product and Methods Nos. 2,046,343; 2,046,837; 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079; 2,090,338 Other Domestic and Foreign Patents Allowed and Pending

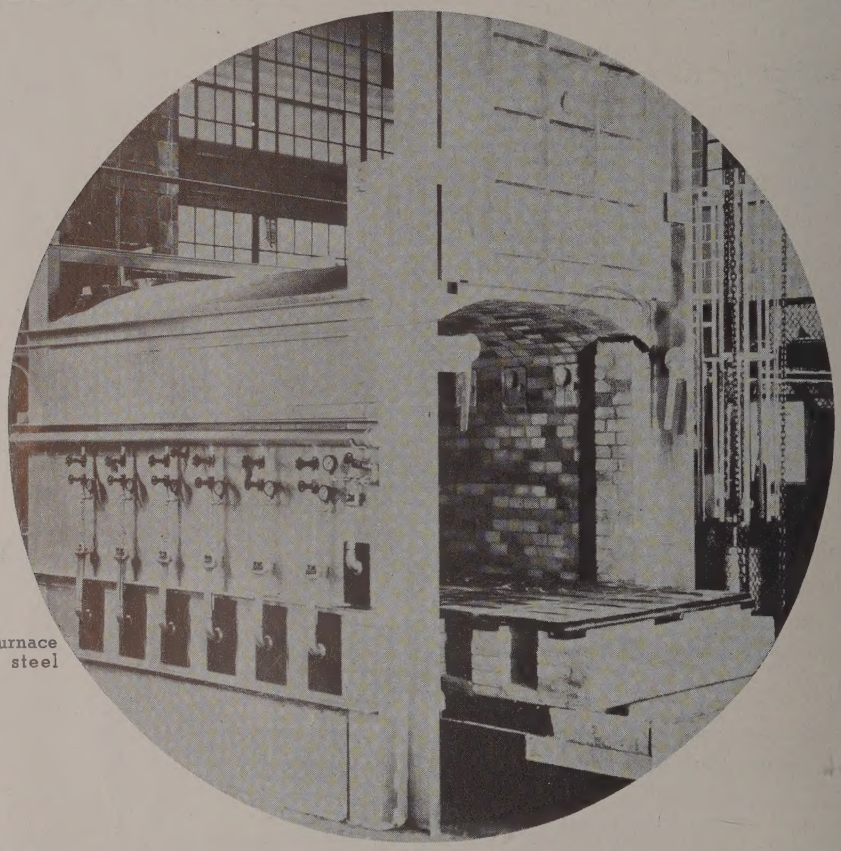
American Screw Co., Licensor
Providence, R. I.
Chandler Products Company,
Euclid, Ohio
Continental Screw Company
New Bedford, Mass.
Corbin Screw Corporation
New Britain, Conn.
The Lamson & Sessions Company
Cleveland, Ohio
National Screw & Mfg. Co.
Cleveland, Ohio
Parker-Kalon Corp., New York, N. Y.
Pheoll Manufacturing Co., Chicago, Ill.
Russell, Burdsall & Ward Bolt & Nut Co.
Port Chester, N. Y.
Scovill Manufacturing Co.
Waterbury, Conn.

. . . IT COSTS LESS TO USE PHILLIPS SCREWS

104, No. 17, April 24, 1939, issue of STEEL, published every Monday at Cleveland, O. Entered as second-class matter at the postoffice, Cleveland, O., under act of March 3, 1879. U. S. and Canada: 1 year, $4; 2 years, $6; foreign countries, 1 year, $10; Current issues, 25c.

Gas HEAT TREATING FURNACE

PERMITS A TEMPERATURE RANGE OF 1500



GAS-fired car type furnace for heat treating steel castings.

Temperatures required for the heat treating of steel castings in the car type furnace shown above range from 350 degrees to 1850 degrees. Because it permits a greater range of turn down than other fuels, this furnace is fired with GAS.

Quality of the castings is maintained at a high peak by automatically controlled heat, good combustion and improved furnace atmosphere conditions obtained by the use of GAS. In this furnace [illegible] features resulted in efficient annealing and tempe[illegible] of castings, but they are advantages which will [illegible] up efficiency and bring greater economy to the op[illegible] tion of any plant where heat must be applied to me[illegible]

Learn how GAS can solve the production probl[illegible] that involve heat in your plant. It may turn pre[illegible] losses into future profits.

There's Nothing Like GAS For

HARDENING	NORMALIZING	FORGING
ANNEALING	BLUEING	GALVANIZING
TEMPERING	CARBURIZING	CORE BAKING
	MALLEABLEIZING	NITRIDING

and many other Industrial Processes

THE TREND TODAY IS TO GAS

FOR AL[illegible]
INDUSTRIAL HEATIN[illegible]

AMERICAN GAS ASSOCIATION
INDUSTRIAL GAS SECTION
420 LEXINGTON AVENUE, NEW YORK

STE[illegible]

THE "RIGHT" NAME FOR QUALITY

To every buyer of Weirton Tin Plate and allied steels, the name Weirite has a special significance. It means that quality is right—dependably uniform in gauge, ductility and coating. It means complete customer satisfaction in the use of Weirton steels. It means, in brief, that combination of product quality, prompt dependable service, and fair dealing that has established—and maintains—Weirton in its unchallenged position as the world's largest independent tin plate producer.

EIRTON STEEL COMPANY · WEIRTON, W. VA.

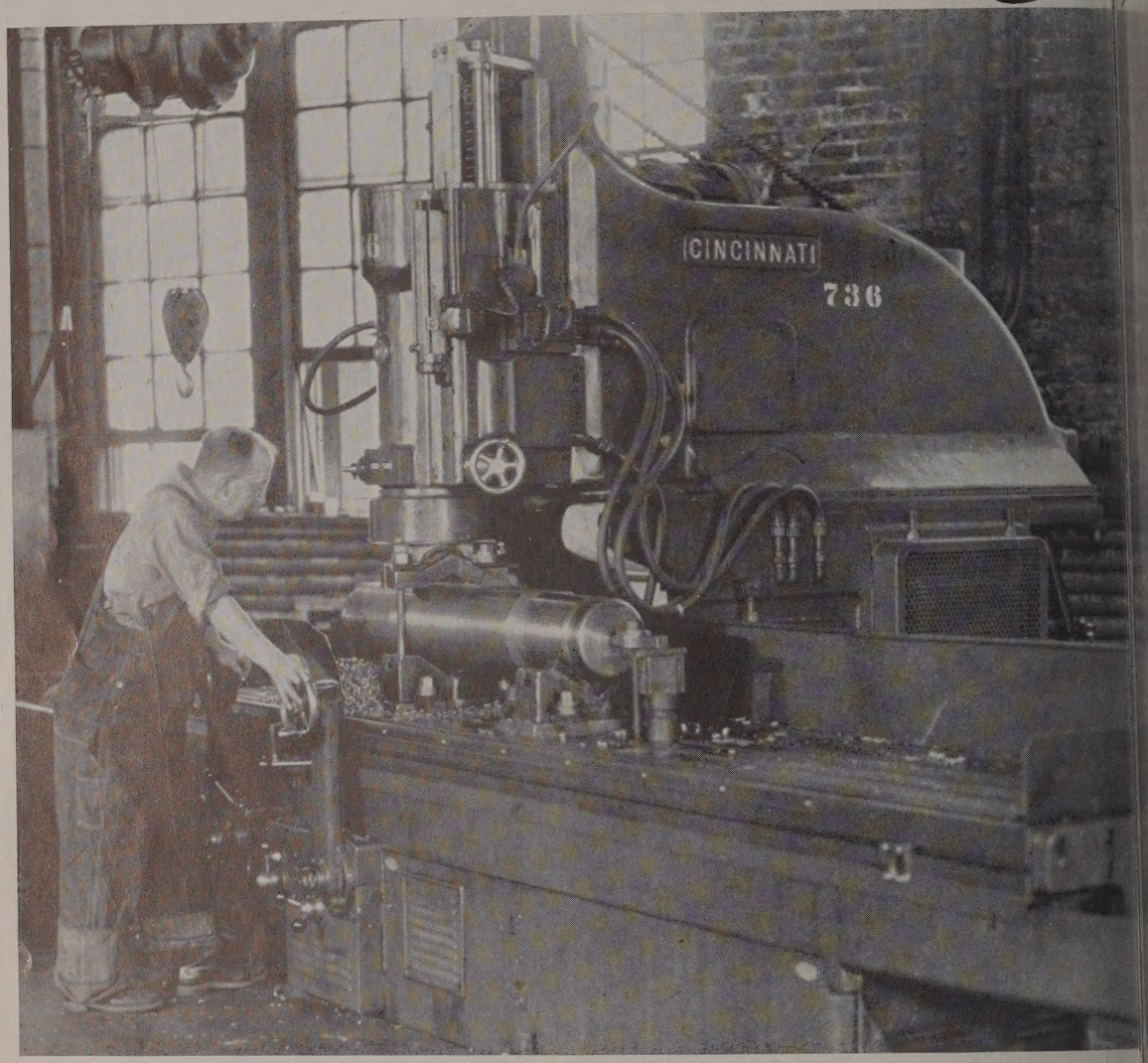
Boston, 1324 Statler Office Building; Chattanooga, Hamilton Bank Building; Chicago, 2120 Builders Building; Cincinnati, 2606-7 Carew Tower; Cleveland, 1217 Leader Building; Denver, John S. Worthington Co., 511-513 Mercantile Building; Detroit, General Motors Building; New York, 405 Lexington Avenue; Philadelphia, Broad Street Station Building; Rochester, Genesee Valley Trust Building; San Francisco, 824 Sharon Building; St. Louis, E. R. Hensel Company, Cotton Belt Building; Montreal, Quebec, A. C. Leslie & Co., Ltd., P. O. Box 1420; Toronto, Ontario, A. MacNish, 357 Bay Street.

NATIONAL STEEL

SION OF

ATIONAL STEEL CORPORATION

TOUGH JOBS LIKE THIS ARE *Easy*



FOR THE CINCINNATI HYDRO-TEL

Milling long round-end keyways in big husky shafts is no push-over for an ordinary milling machine. And when a square must be milled on the end of the shaft with a 12" face mill, taking cuts at the rated horsepower capacity, the job is just twice as tough. That's the kind of work this CINCINNATI Hydro-Tel Vertical Milling Machine is doing day in and day out.

The shafts range in size up to 12" diameter, and some of the keyways are as large as 2 1/2" wide x 1 1/4" deep and 72" long. Savings over the former method a 18%.

A machine for this job has to be big and husk the CINCINNATI Hydro-Tel is just that. In a to being built to take heavy cuts, the and cross slide may be positioned to the racy required of die sinking work, and so that the operator can work the controls all day without tiring. alog M-796 tells the whole story. for a copy.

CINCINNATI

A SYMBOL OF A DEFINITE STANDARD OF WORTH

THE CINCINNATI MILLING MACHINE CO

Cincinnati, Ohio, U. S. A.

READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Gave the Answers

Editor:

he April 10 issue of STEEL I in the article on "Pure Iron r" the answers to many ques- hat had been floating around mind. I had thought that re- work had been done along es there pointed out but I no way of learning what had one, by whom and the pos- future developments that be accomplished.

BRUCE PAYNE

rial Engineer,
al City Bank,
and

ngs Chart Best Ever

Editor:

ant to compliment STEEL on ticle in the issue of April 10 ned "Steel Industry's Earn- nsufficient to Pay Funded Debt st in 1938," and especially on ancial analysis chart.

put out excellent charts in us years but this is the best. valuable assembly of figures ery steelmaker and of immedi- terest.

A. W. MACE

ant Secretary-Treasurer,
eny Ludlum Steel Corp.,
enridge, Pa.

ressman on Machines

e Editor:

o not wish to be regarded as ho is opposed to progress or dful of the benefits machinery brought to mankind, and ally to this nation. I realize n the regulation of machinery, to alleviate the ill effects of sultant displacement of labor, that we have a tremendous problem. Nevertheless, I believe it is impossible for this country to prosper with as many unemployed as we have at present. An unemployed man is either a non-consumer or a very limited consumer and the theory of technological advancement is to create consumption. If it fails to do this, it is a failure.

I realize that machinery has brought a great many commodities within the reach of the mass of consumers. However, I believe at present we are super-saturated with machinery and that this condition has prevailed for the past 15 years. Whether this condition will be permanent or not, I am not prepared to say, but it is permanent enough at present to merit serious consideration, which it is not receiving.

In the second paragraph of your editorial (STEEL, March 27, p. 34) you remark concerning the tax load upon industry. A great deal of this tax load is necessary because of the relief caused by displacement of labor by machinery. One of my greatest fears regarding machinery is the tendency of a great many to refuse to look at the true facts surrounding the problem. For instance those in favor of machinery resort to trick figures and theoretical answers to prove that machinery produces more jobs than it displaces.

Nevertheless, we have the unemployed, which is a concrete condition and cannot be eradicated by trick figures or abstract arguments. Then we have another class, all too prevalent in this nation today, who believe anything can be solved by a paternalistic program. To illustrate, one of my colleagues the other day, following some remarks I made on the floor of the house regarding this matter, said to me: "You have not thought this matter through. We can take care of the unemployed by decreasing hours and by taxing the machinery to keep the workers displaced."

His ignorance was so colossal that I did not bother to ask him if he had ever heard of the law of diminishing returns. Nevertheless, he represents, I fear, the viewpoint of a majority of voters of this nation, who, whether their ideas are economically sound or not, seem to be able to put them into effect.

I do not believe this problem can be solved by putting more machines to work. I believe that was true in the past, but we have reached a point where production has far outdistanced our ability to consume. Neither do I believe that our ability to consume can be increased by any such panaceas as the Townsend old age pension, currency inflation, or anything else.

I do believe that machinery can be classed as three kinds: First, that which is really work-producing, such as the automobile, the radio and like machinery; second, that which goes to save men from being put at hard, arduous, dangerous toil; third, that which displaces labor merely in the interest of time. It is this third class that rushes industry for a short time and necessitates a shutdown during the rest of the year.

It has not cheapened the product or resulted in increased consumption. It results in putting men to work with a rush for two or three months at high wages, which they spend as they make them, and for the remaining months they must go on the WPA or live on credit in very reduced circumstances. Most certainly the nation as a whole would be better off if this work were

(*Please turn to Page* 87)

SALEM CIRCULAR SOAKING PITS

Capacity far greater than conventional type pits, greater control is afforded by the circular design and construction,—proved economy. Far more than merely heating units—"Salem" Circular Soaking Pits are heat treating furnaces, imparting to the ingot a splendid condition, acknowledged by the men who use them. Originated and developed by "Salem."

SALEM ENGINEERING CO., SALEM, OHIO, U. S. A.

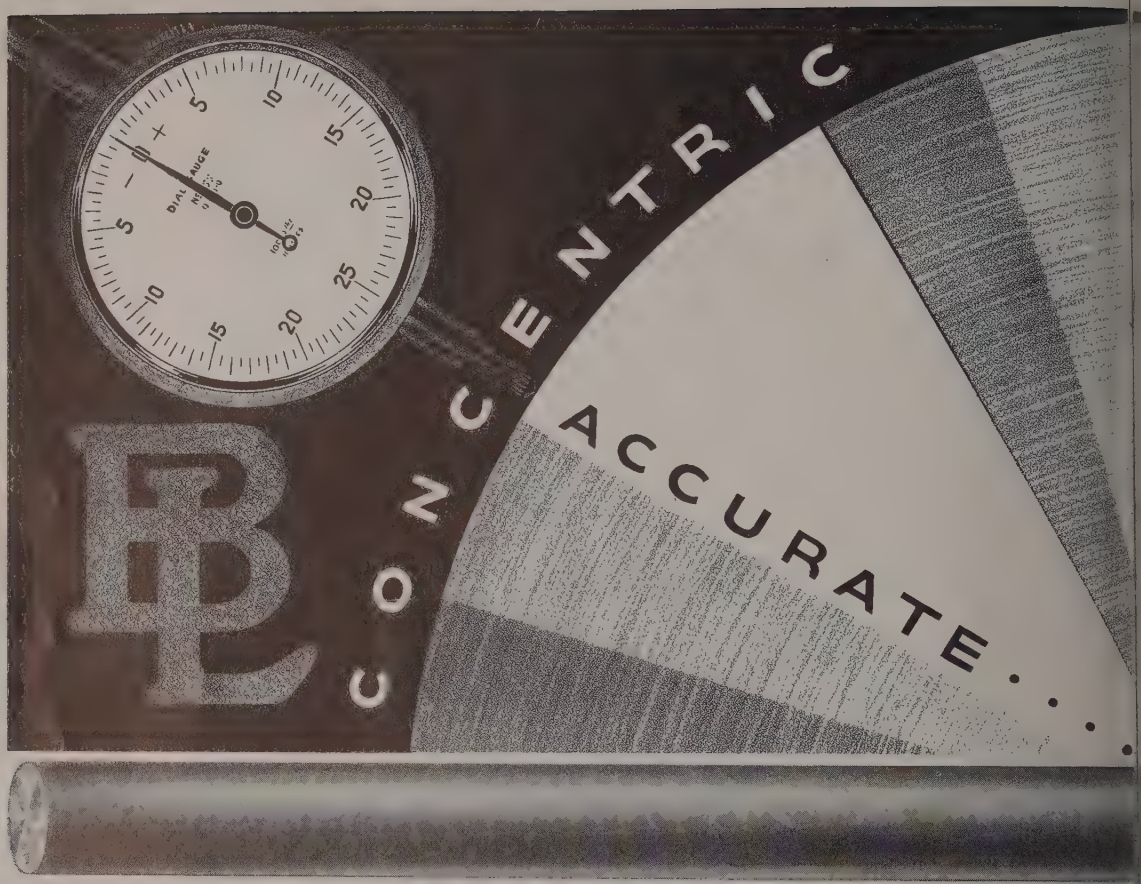
CHICAGO—DETROIT—PITTSBURGH—NEW YORK
LONDON—PARIS—BERLIN—WELLAND, ONTARIO

STEEL

ESTABLISHED 1882

Contents

Volume 104—No. 17 **April 24, 1939**



Quality . . . COLD FINISHED SHAFTI

Wheels must turn faster—and sha
ing run smoother—to speed up th
year's rate of production, and cut dow
next year's machine depreciation. I
dustry voices approval of B & L Co
Finished Shafting in terms of eve
increasing tonnages. Its use is justifi
in quieter running machines, longer live
bearings and reduced friction, vibrati
and wear. Extremely close toleranc
are met by the most advanced metho
of cold working, straightening, grin
ing and polishing—and maintained b
scrupulous care in testing and inspecti

The extra quality built int
B & L Cold Finished Sha
ing means extra economi
for manufacturers using

COLD DRAWN
TURNED AND POLISHED
DRAWN, GROUND, POLISHED
TURNED, GROUND AND POLISHED

BLISS & LAUGHLIN, INC.

Let B & L engineers solve your shafting problems.

HARVEY, ILL. *Sales Offices in all Principal Cities* BUFFALO, N.Y.

COLD DRAWN BARS • GROUND SHAFTING • LEADED STEELS • SCREW STOCK • EXTRA WIDE FLATS • ALLOY ST

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

the Editor
ews the News

T WEEK, the third since the suspension of ining in the Appalachian region, witnessed inary measures by the steel industry to con- ts coal and coke supplies. Nine blast furnaces ne coke oven battery were banked. East- dustrial companies (p. 21) have begun plac- d orders abroad, mainly with Welsh producers, ment their dwindling supplies. The railroads oking for sources of supply. . . . Recession in uying continues, but at a mild pace. Steel out- opped one point last week (p. 19), bringing got rate to 50.5 per cent; further recession, collapse (p. 71), is expected. Automobile out- p. 30) has expanded for the third successive but the indications are that the spring peak is d.

• • •

t quarter profits of representative metalwork- mpanies so far reporting are (p. 19) 65.9 per etter than those of a year ago. . . . Efforts to knit together a fourth huge combination of automobile companies (p. 29) are reported as a little beyond the rumor stage. . . . War fears have accelerated European nd steel production; annual ingot capacity of r Germany (p. 15) now is estimated at 25,000,- ns. . . . The $7 a ton reduction in import duty ed in the trade treaty with Canada is regarded e most serious problem of the zinc industry 7); it has forced the industry to reduce pro- n, payrolls and employment. . . . Second quar- eight car requirements (p. 18) are estimated at er cent above those of second quarter of 1938.

lings rove

• • •

ate military affairs committee (p. 25) has re- d out the Sheppard bill for exchanging obsolete, table and unserviceable machinery and tools in ordnance plants for new machinery and tools. Details of the national defense program rapidly are being crystallized by congress. Hearings on proposed Wagner act ions are in progress. . . . Activity in the depart- of commerce is at a standstill (p. 26) because -health of Secretary Hopkins. . . . The administration can, if it will, start this country back to real prosperity, declares E. T. Weir (p. 33); he doubts whether necessary action will be taken. . . . The aircraft industry's huge backlog of unfilled orders (p. 27) continues to grow as new manufacturing facilities are added.

Tools Old

• • •

Machine operators do better work when they have good tools and agreeable working conditions (p. 38), says Guy Hubbard. Plates marked to indicate the cost of each machine are found to stimulate the men toward turning out their best work. . . . External influences and internal reactions that have a bearing on the castability of metals were subjected to detailed discussion at last week's foundry conference (p. 51) at Michigan state college. . . . Faulty hiring systems were attacked at last week's conference (p. 56) of New England foundrymen; numerous devices which have improved industrial relations were cited. . . . An interesting procedure was developed (p. 58) for fabricating the color drums in the Lagoon of Nations at the New York World's fair.

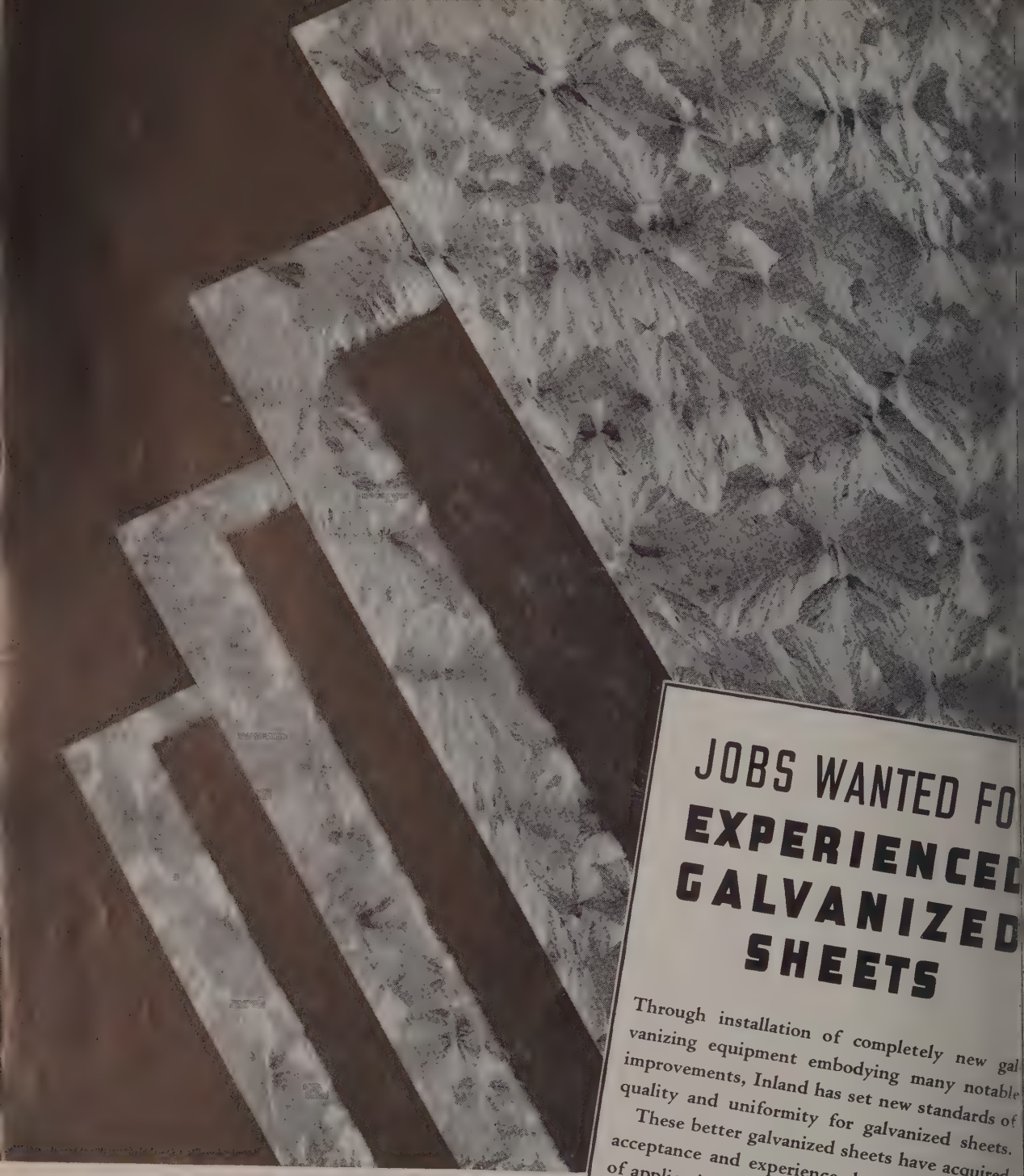
Better Work

• • •

Steel tubing should assume a more important place in aircraft construction due to its many inherent advantages, says one authority (p. 40). He discusses the significance of the new structural research laboratory planned by the National Advisory Committee for Aeronautics for location at Sunnyvale, Calif. . . . A new type furnace for heating rounds for piercing (p. 44) has a walking beam mechanism and is said to produce a more uniform heat, to reduce fuel cost and cut working time; all surfaces exposed to furnace temperature are covered with plastic chromium patch. . . . Frequency-sensitive relays in a new control system (p. 52) permit smooth, accurate, fast operation of cranes with wound-rotor motors. . . . New coatings protect steel against corrosion during shipment and storage.

Steel Tubes In Planes

E C Kreutzberg



JOBS WANTED FO
EXPERIENCED
GALVANIZED
SHEETS

Through installation of completely new gal vanizing equipment embodying many notable improvements, Inland has set new standards of quality and uniformity for galvanized sheets.

These better galvanized sheets have acquired acceptance and experience data in many fields of application.

They will undertake your most difficult forming problems or requirements for long life—with assurance of minimum fabrication costs, and satisfactory results.

There are six types of coatings and a number of variations of the base sheet which Inland metallurgists will adjust to your particular purpose.

Write, or call your nearest Inland office for full information.

INLAND STEEL CO.

38 SOUTH DEARBORN STREET, CHICAGO
DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. PAUL

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES
STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

rmament Race Spurs European Steel Output; Export Trade Disrupted

By VINCENT DELPORT
European Manager, STEEL

LONDON

MANY, by her latest "pro- move in Czechoslovakia, has ,600,000 metric tons to her king capacity and buttressed ition as the largest steel pro- country in Europe.

38 Germany produced 23,241,- ric tons of steel ingots and s, including the output of n works from March 15. She producing at a rate of about 0 tons a month, which is near furnace capacity. It may, re, be estimated the present capacity of greater Germany t 25,000,000 tons.

developments in progress at mann Goering plants and at in Montan works in Austria, in both cases operations may t the end of this year, and he added output of Czechia, ny will before long have 30,- metric tons (29,526,000 gross f steel at her disposal.

interesting to note the in- of Austrian steel output since ks have come under German . In 1937, which was a year production for independent Austria, the output averaged 160,- 000 metric tons per quarter. In 1938 the figures were: 110,754 tons in the first quarter; 178,141 tons in the second; 193,388 tons in the third; and 195,000 tons in the last quarter.

In January, Austrian steel furnaces produced 76,465 tons, indicating the average output per quarter will exceed 200,000 tons, and eventually an output of more than 1,000,000 tons a year can be expected. The output of the Czech works may not be increased in a similar proportion, but probably could reach 1,750,000 tons if worked close to capacity. A brief review of the Czech steel industry was given in STEEL, Oct. 31, 1938, at the time Germany occupied the Sudeten regions.

Germany is working at high pressure to meet requirements of her spectacular armaments program. There is reason to believe that although furnaces are being operated as near capacity as safe for the equipment, the rate of output is hardly sufficient. It is noticeable that although the monthly production of pig iron now exceeds 1,500,- 000 tons, this is supplemented by imports. These now reach nearly 100,000 tons a month, whereas a year or so ago the average monthly imports of pig iron were under 20,- 000 tons.

Imports of iron ore range from 1,- 500,000 to 2,000,000 tons a month. Germany evidently is making greater use of her own lean ores and may avail herself of part of the iron ore resources of Bohemia and Slovakia. In 1937, Bohemia and Moravia produced 745,000 tons of iron ore, and Slovakia and Carpatho-Ukraine 1,- 000,000 tons.

Generally speaking, the German

■ **Steel air raid shelters are distributed gratis to British families whose earnings do not exceed $1250 annually. Shelters accommodate six people, are sunk 6 feet in the ground, require steel corrugated sheets and light sections in a quantity that assures busy British mills for months. At right, two housewives in London's poorer section are puzzled by the problem of assembling a free shelter. At left, new portable triangular shelter that can be erected quickly and easily. NEA photos**

domestic market is most active. Apart from direct orders for armament, the demand is considerable for all categories of steel products and machinery.

In some cases, periods of delivery for certain types of machinery exceed a year, due in part to lack of skilled workmen. There is no more unemployment in the German steel industry. The less favorable factor in the German outlook is the continued sluggishness of export trade. The competition of works, annexed or controlled as a result of political events, also creates a problem, the solution of which is the subject of study by Germany's economic advisers.

The war psychosis resulting from the actions of Germany in central Europe and the attitude of Italy, her partner in the axis, is acting as an incentive to iron and steel production in most of the producing countries of Europe, but partly to the detriment of normal commercial transactions, which, in any case, are at present subdued by anxiety and uncertainty about the future.

In Great Britain activities of the steel industry have taken a decided turn for the better in comparison with last year. For the first time since March, 1938, the output of steel reached 971,100 tons in February, and it is probable that a monthly figure of 1,000,000 tons will soon be reached again. It is now a common occurrence for furnaces which had been idle for several months to be relighted.

Large Demand for Scrap

Semifinished steel imports are growing again, to supplement domestic production, and the demand for scrap tends to exceed the supply.

A substantial proportion of the increased activity of the steelworks is due to government contracts for the defense program. Sheet mills will be busy for months, and so will rolling mills making light sections, in supplying material for shelters that are being distributed in London and other centers which are considered possible targets for air raids. These shelters are made of corrugated sheets, with the necessary stanchions and uprights, and are supplied free to exposed households whose earnings do not exceed $1250 a year. A sum of £20,000,000 has been earmarked for this form of air raid protection, commonly known as A.R.P.

Other channels in which steel is required for armaments are shells, antiaircraft guns, ships, and, indirectly, plant and machinery required for their production.

However, war manufactures are not the sole reason for greater industrial activity in Great Britain. There are definite signs of liveliness in ordinary industrial fields, and, to mention only one of the most important, the automobile industry has been reviving materially since the beginning of the year, both in home and export markets.

In all industrial districts, constructional and mechanical engineering concerns are active. Shipbuilding is practically the only black spot remaining, and the railroads are ordering sparsely, owing to their unfavorable financial situation. Coal exports are slack, but home demand is improving.

Generally speaking, conditions in Great Britain undoubtedly would be on the upgrade if it were not for the abnormal international situation. As it is, domestic activities are brisk, and that business which is lost in normal channels is made up by government contracts.

Exporters Suffer Restrictions

On the other hand, British export trade is suffering decidedly from present conditions. This is due not only to the general state of uncertainty, but also to the many obstacles placed before commercial exchanges by those countries whose policy it is to become more and more self-contained, and which make up for their stringency of foreign currency and exchange by a barter system in which Great Britain takes little or no part.

In France iron and steel production also have risen, but demand comes for the greater part from government sources, mainly to consolidate the defenses of the country. The menace from the East has brought about a strong tendency among the various political parties to unite, at least insofar as the present period of emergency is concerned.

Premier Daladier has obtained full powers from parliament until the end of November. One of his first acts has been to modify by decree the legislation covering hours of work. The 40-hour week now is retained only as a principle, but factories controlled by or working for the state can be made to work as much as 60 hours a week, with adequate adjustments in wages.

Not long ago the French finance minister was able to report considerable progress in the country's financial situation. Not only has the flight of capital been stopped, but gold has been returning to France and her credit has improved, the bank rate being as low as 2 per cent.

Unemployment is decreasing, and export trade is improving, although still below normal. Should the international situation clear up, it is likely that measures recently taken and the relief that would be felt, as well as the needs that have accumulated in the past years of recession, would cause the French to re-enter a period of industrial ascend

French steel output now rate of about 600,000 tons p The increase in demand is m open-hearth steel.

Turning to eastern Euro is considerable activity in R Poland. The Soviet autho contemplating another 5-y during which steel output increased by 56 per cent and output by 52 per cent. If gram is followed Russia mi the output of greater Germ

Poland in January produ than 150,000 metric tons of gots and castings, equivale annual output of 1,800,000 t siderable capital is being in the Polish steel industry.

Italy also is making grea to intensify iron and steel tion, but apparently under ties, since steel output in barely attained 180,000 tons. in July last year the output 000 tons. As in Germany, al is preserved for essentia government work.

In the midst of all the E turmoil, the International S tente is carrying on with it of export trade control. It with renewed difficulties on of constantly changing cond central Europe.

Wants Larger Quot

Poland has requested a quota of exports since the works was taken over from A provisional tonnage of 850 month has been granted. N afterwards, the Czechs the based a demand for a large on their intention of expandi own remaining plant. No Germany considers Czechi kind of protectorate the situ further complicated. In the time, price cutting by Poli Czech works has been repor

Another difficulty in the the Steel Entente is that of ting competition from the States, and Australia, which cently appeared in certain markets. The only policy adopted is to allow entente in to make certain price concess so-called "free" or unorganize kets, whereas in "organized" kets, such as Great Britain, the entente has its represen operating in contact with t mestic organization, price fi rigidly adhered to.

SURVEY SHOWS ITALY L ESSENTIAL MINERALS

Italy's natural resources a less adapted than those of Ge to the development of the he dustries so essential to carryi a program of rearmament an sufficiency, according to an ec

(*Please turn to Page* 70

: Industry Beset by Tariff, ght Cuts, London Price Control

ST. LOUIS

E than 200 members of the n Zinc institute and the Gal- committee, the latter com- representatives of 20 steel ies, met at Hotel Statler here k to discuss marketing and l problems.

he zinc industry, the most problem was considered to 7 a ton reduction in import ich was included in the trade signed with Canada a few ago. In practice, the reduc- lies to all nations entitled to vored nation treatment.

ssions disclosed the London actually controls world price although it accounts for only part of the metal sold, even the United States. Reduc- the protective tariff to 1.40 er pound has resulted in low- es, and as E. V. Gent, insti- cretary, pointed out, the en- lustry has been forced to re- roduction, payrolls and em- nt.

Zinc Imports Increasing

Gent said the ocean rate on the East coast has been cut in half, to 22 cents per hun- hus further aggravating the on. The institute now is re- g imports of zinc ore, metal dmium since the movement ming more significant. One steelmaker recently placed an for 1500 tons of foreign zinc, reported.

sion of the tariff reduction Canadian treaty came as a te surprise to many in the but it is believed the situa- nay be relieved. In fact, a r of zinc users have expressed sympathy with the zinc industry's unfavorable position and have indicated domestic metal would be purchased even though the foreign price dipped below the level in this country.

Increasing importance of the foreign market as related to the domestic situation resulted in considerable discussion of various factors abroad. In a paper prepared by O. W. Roskill, industrial consultant, London, England, it was noted that, more and more, zinc is being relegated to the status of a by-product metal. This is due to technical improvements in treating complex ores, and also to the fact consumption of lead has always tended to remain more stable than that of zinc, so in times of depression the production of the minimum tonnage of lead required for consumption results in an overproduction of zinc concentrates. The custom smelter of zinc, of course, stands to lose little by a fall in zinc prices since treatment charges vary little.

Mr. Roskill places the minimum price at which zinc can be sold without a loss at around £12 10s to £13 per ton, or at about 2.70c to 2.75c per pound. He also stated that galvanizers abroad are being forced to recognize there has been a permanent decline in demand for galvanized sheets.

George H. Cunningham, consulting engineer, Baltimore, declared the move toward self-sufficiency has resulted in a sharp expansion in electrolytic zinc production capacity abroad. He cited the large plants in Italy, Russia, Germany, France, Australia and Canada. He said Cerro de Pasco Copper Corp. is planning a large electrolytic plant in Peru. Noranda Mines Ltd. is considering a plant in eastern Canada, while Trepca Mines Ltd. may construct a works in Jugoslavia.

In discussing equipment, Mr. Cunningham said improved efficiency of steam-driven power plants had made them competitive with hydro-electric installations. Present electrolytic capacity of the United States is 196,000 tons annually, he estimated; Canada's capacity is 165,000 tons, the two combined accounting for 48 per cent of the world total.

George C. Heikes, chief mining engineer, St. Louis Smelting & Refining Co., St. Louis, estimated European zinc reserves at 17,500,000 tons, against 12,000,000 tons in the United States. Germany has about 40 per cent of the European total, Poland 30 per cent, Italy 20 per cent and Jugoslavia, France and Spain, lesser amounts. The most important European deposits are in Upper Silesia and are owned by Poland and Germany. These deposits average 15 per cent zinc and 2.5 to 3 per cent lead. Workers in the area receive about $1.40 per 8-hour shift and turn out about one ton of ore per shift.

Says Washington Awaits 1940

Julian Conover, secretary, American Mining congress, Washington, told members the legislative picture in Washington is mainly political. Members of congress and the administration are principally concerned with the issues of 1940, he said. Current action, and lack of action, is based in a large measure on the effect it is likely to have on the elections. The events of last fall had a sobering effect on congress, he said, and are reflected in the lack of new or radical legislation.

Congress is showing an increased desire to give business and enterprise an opportunity, Mr. Conover stated. The movement is gaining strength to revise restrictive legislation now in effect, including the national labor relations act, social se-

■ American Zinc institute and Galvanizers' committee members at annual dinner, Hotel Statler, St. Louis

curity, bituminous coal and tax laws. He doubted whether much could be accomplished this session, however, due to efforts to adjourn about June 15 or July 1.

The Zinc institute is continuing its drive to extend the use of galvanized steel products in farm areas. Tonnage business is believed to be mainly in galvanized sheets for farm buildings. In this direction, the Tennessee Coal, Iron & Railroad Co. has had considerable success with galvanized steel panel sections which facilitate construction of any size building at low cost. The Zinc institute also has inaugurated a plan to aid builders.

Reveal Survey Findings

At a roundtable conference of the Galvanizers committee, the results of a 3-year survey on galvanized coatings were revealed. This showed no decrease in the average coating used although it is below the two-ounce standard suggested by the Zinc institute. The committee has encountered considerable success in improving technical practice through information exchange. It now has 20 active members accounting for over 90 per cent of the steel industry's galvanized sheet capacity. Great Lakes Steel Corp., Detroit, recently joined. A meeting is planned for mid-November in Pittsburgh which will include two plant visits.

B. P. Finkbone, galvanizing consultant, American Rolling Mill Co., Middletown, O., presided at the final technical session. At this session, W. M. Peirce, chief of research, New Jersey Zinc Co., New York, expressed the opinion that high tin content of zinc coatings was responsible for the rapid rate of corrosion. He said that the tin does not stay in solution in the coating and an electrolytic action takes place between tin and zinc. In studying galvanized tank failures, it was noted that coatings containing only small amounts of tin proved to be most protective.

At the same session, Ernest Mantius, National Lead Co., New York, described proper procedure for constructing lead linings for acid resistant equipment. For tank work, supporting vessels of steel are most suitable, he said.

"Steel—Man's Servant," the United States Steel Corp.'s technicolor movie, was a feature of the program.

Howard I. Young, president, American Zinc, Lead & Smelting Co., was re-elected president of the institute; C. Merrill Chapin Jr., vice president, St. Joseph Lead Co., eastern vice president; John A. Robinson, Commerce Mining & Royalty Co., midwestern vice president; James O. Elton, manager, International Refining Co., western vice president; and E. V. Gent, secretary. John L. Good, Eagle-Picher Lead Co., was named treasurer, succeeding the late James Caselton.

Battelle To Do Research For Tin Producers, Users

■ Tin research in the United States by International Tin Research and Development council, representing tin producers of the world, will be continued at Battelle Memorial institute, Columbus, O. Arrangements also have been made to have research staff at Battelle for consideration of technical tions arising with American users.

Formation of an independent search organization had been consideration, but facilities ready developed by Battelle ice will be afforded all in in this country that use tin

Middletown, O., Ho Rolling Mill Preside

■ Charles R. Hook, president ican Rolling Mill Co., was a testimonial dinner by 13 dletown, O., citizens last we Hook was presented three tos: A bronze plaque on wh inscribed a statement of th munity's gratitude for his ship by Middletown citizens: containing names of 900 Boy in the city; a bouquet of 3 one for each year of servi the company, by the Arm erans club.

Robert L. Lund, executi president, Lambert Pharma St. Louis, and a past presi the National Association of facturers, was a guest speak praised Mr. Hook's service as president of the manufa group, cited other achievem the Armco president, especia study of European labor co while a member of the Pre commission.

In response, Mr. Hook paid to George M. Verity, the com chairman, to employes and th munity.

Many congratulatory m were read by George M. president, Middletown Civic a tion.

Forecast 12.6% Incre In Quarter's Carload

■ Freight car requirements f ond quarter will be 12.6 pe higher than in the corresp period last year, estimate the r al shippers' advisory boards. 29 principal commodities, the t predict 4,684,443 carloadings quarter, compared with 4,159, the 1938 period.

Greatest increase will be i concentrates, estimated to r 326,937 cars, against 189,636 year, a rise of 72.4 per cent. mobiles, trucks and parts will 136,340, against 85,508, or 59. cent more. Iron and steel ar mated to take 318,873, a 45 pe increase over the 219,894 ac required in the second quarte year.

Mining Town Has Enameled Steel Schoolhouse

■ **Light weight, moderate cost, noninflammability and resistance to earth movements peculiar to mining regions are among advantages claimed for this "first all-porcelain-enameled-steel schoolhouse" at Girardville, Pa. It was designed by D. H. Grootenboer and Philip G. Knobloch, architects, Pottsville, Pa., using Republic Steel Corp. sheets, enameled by Enamel Products Co., Cleveland**

ANCIAL

BLIC'S FIRST QUARTER PROFIT $532,899

PUBLIC STEEL CORP., Cleve- eports first quarter net profit ,899, equal to 9 cents a com- hare, compared with $308,613 ofit in the December quarter. first three months last year of $3,062,564 was incurred. ges for depreciation and de- amounted to $2,774,125 for arter ended March 31 last, t $2,705,921 charged in the period last year. Interest on debt amounted to $1,055,781, 30,000 was charged for esti- federal income tax. Truscon o., Youngstown, O., Republic iary, had a net profit of $20,418 e first quarter, compared with loss of $395,144 for the corre- ng period of 1938.

QUARTER STATEMENTS

e Steel Co., Chicago, net profit 9,671, equal to $1.04 a share ital stock. In the same period ar net profit of $969, or 1 cent e was reported, while in the 938 quarter net profit totaled 26, or 62 cents a share.

ron Steel Corp., Sharon, Pa., ofit $7613, or 13 cents a share e $5 preferred stock, against ss of $151,909 in the compar- 938 quarter.

gheny Ludlum Steel Corp., Pittsburgh, net profit $206,582, or 12 cents a share on common stock.

M. A. Hanna Co., Cleveland, net profit $172,105, after interest on long term debt, federal taxes, depreciation and depletion. Net income in the preceding quarter was $409,475, and in the first quarter of 1938, $57,562.

Keystone Steel & Wire Co., Peoria, Ill., net profit $317,608, equal to 42 cents a share, against $187,569, or 25 cents a share in first quarter, 1938. In the fourth quarter last year, net profit was $115,728, equal to 15 cents a share. Net profit in the nine months ended March 31 last totaled $516,560.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended April 22	Change	Same week 1938	Same week 1937
Pittsburgh ...	43	— 2	29	95
Chicago	53.5	None	30.5	84.5
Eastern Pa...	38.5	— 1.5	28	59.5
Youngstown..	43	None	31	86
Wheeling	65	None	44	96
Cleveland ...	36.5	— 3	30.8	79.5
Buffalo	46.5	+ 2	30	93
Birmingham..	60	None	66	80
New England.	35	None	25	100
Cincinnati ...	44.5	None	45	86
St. Louis.....	46	— 5	36.3	82
Detroit	57	— 2	18	95
Average....	50.5	— 1	32.5	91.5

talworking Companies' Net Earnings Up 65.9%

TAL net income of 31 companies among equipment manufacturers, iers and consumers in the first quarter aggregated $18,793,423, or an ase of 65.9 per cent over the $11,331,162 total income reported by the ical companies in first quarter, 1938. In the following tabulation all es are net income, except where asterisk denotes loss.

	First Quarter 1939	First Quarter 1938	First Quarter Income Per Common Share 1939	First Quarter Income Per Common Share 1938
Castle & Co., Chicago	$ 35,880	$ 66,138	$0.15	$0.27
can Brake Shoe & Foundry Co., New York	408,937	240,486	0.44	0.22
Aviation Corp., Chicago	1,023,996	561,605*	0.49	0.27*
& Laughlin Inc., Harvey, Ill.	134,381	26,091*	0.75	0.18*
port Machine Co., Wichita, Kans.	139,264*	10,338*	0.56*	0.09*
Jackson Co., Los Angeles	119,071	227,966	0.31	0.60
illar Tractor Co., Peoria, Ill.	928,118	807,907	0.42	0.35
l Ohio Steel Products Co., Galion, O.	40,867	50,235	0.31	0.38
-Hammer Inc., Milwaukee	56,702	34,417*	0.09	0.05*
Electric Co., Marion, Ind.	64,347	107,822	0.67	1.08
t Gasket & Mfg. Co., Detroit	128,010	23,807*	0.53	0.18*
Mfg. Co., Detroit	725,999	199,042*	1.03	0.28*
al Electric Co., Schenectady, N. Y.	7,373,431	7,075,739	0.26	0.25
e Safety Razor Co., Boston	867,547	755,864	0.24	0.19
L. Martin Co., Baltimore	682,496	628,563	0.62	0.72
son-Walker Refractories Co., Pittsburgh	207,500	142,500	0.12	0.07
-Manville Corp., New York	125,118	239,475*	0.01*	0.44*
Young Spring & Wire Corp., Detroit	109,355	246,270*	0.27	0.60*
Products Corp., Detroit	66,961	37,862	0.17	0.09
nal Malleable & Steel Castings Co., Cleveland	286,329	418,739*	0.59	0.87*
York Air Brake Co., New York	107,803	92,268*	0.42	0.36*
her Mfg. Co., Elmira, N. Y.	183,919	117,886	0.54	0.09
n Roller Bearing Co., Canton, O.	1,907,393	273 266	0.79	0.11
ard Products Co., Cleveland	115,823	8,023	0.39	0.03
heater Co., New York	174,938	118.802	0.19	0.13
ue & Williams Steel Forging Corp., Alliance, O.	7,930	68;219*	0.06	0.50*
Coach Co., Kent, O.	55,985	21,389	0.12	0.05
Norman Machine Tool Co., Springfield, Mass.	58,565	117,335	0.66	1.32
nghouse Air Brake Co., Wilmerding, Pa.	399,015	135,030	0.13	0.04
nghouse Electric & Mfg. Co., E. Pittsburgh	2,356,150	2,031,230	0.88	0.75
ward Iron Co., Woodward, Ala.	180,121	287,390	0.66	1.06

PRODUCTION

■ STEELWORKS operations last week declined 1 point to 50.5 per cent, lowest since the final week in December. Reductions were made in five districts, an advance in one and six were unchanged. A year ago the rate was 32.5.

Youngstown, O.—Held at 43 per cent, three bessemers and 37 open hearths active. Youngstown Sheet & Tube Co. and Carnegie-Illinois Steel Corp. each has banked a blast furnace, and Republic Steel Corp. a coke oven battery, to conserve fuel.

Chicago—Unchanged at 53.5 per cent for the fourth week.

St. Louis—Down 5 points to 46 per cent as one interest shortened its work week.

Birmingham, Ala.—Steady at 60 per cent, with 12 open hearths on.

Cincinnati—Continued at 44.5 per cent, with no change in prospect.

Pittsburgh—Dropped 2 points to 43 per cent. The same schedules are expected this week.

Wheeling—Held at 65 per cent.

Detroit—Off 2 points to 57 per cent as one producer changed to smaller furnaces.

Central eastern seaboard — Declined 1.5 points to 38.5 per cent as shipments exceed bookings.

Buffalo—Increased 2 points to 46.5 per cent, equaling the highest rate this year.

Cleveland—Lost 3 points to 36.5 per cent.

New England—Remained at 35 per cent. Finishing operations are slightly higher.

Foundry Equipment Orders Up in March

■ March foundry equipment orders were higher than in February, according to the Foundry Equipment Manufacturers' association, Cleveland. Indexes based on 1922-24 show the following comparisons:

	Mar. 1939	Feb. 1939	Mar. 1938
Net orders	146.6	135.3	114.6
Shipments	128.1	112.2	99.4
Unfilled orders	193.6	175.1	172.3
3 mos. av. gross orders	134.9	133.3	94.4

■ United Engineering & Foundry Co., Pittsburgh, manufacturer of rolling mill equipment, will dismantle its machine shop at Wooster, O., and ship equipment and part of the buildings to Japan. Announcement was made by George T. Ladd, president, who explained the company would operate the plant in Japan and that it had not been sold to Japanese interests. The company also operates plants at Pittsburgh and Youngstown, O.

Activities of Steel Users, Makers

■ APPALACHIAN Coals Inc., Cincinnati, has established a southeastern office in Knoxville, Tenn., in charge of T. A. Day, assistant secretary of the company. The purpose is to give better service to its constituent companies which ship into Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee and Virginia, and to their customers. Mr. Day has served as manager, advertising and publications department, Appalachian Coals Inc.

♦

Fairbanks-Morse Co., Beloit, Wis., recently acquired a 1½-ton nose-tilt gray iron furnace from Pittsburgh Lectromelt Co., Pittsburgh. Lectromelt also has under construction two furnaces for shipment to China.

♦

Joseph T. Ryerson & Son Inc. have enlarged their steel service plant in Cambridge, Mass., by 30 per cent, added new storage facilities and cutting and handling equipment. More than 5000 new items have been added to stocks, including new qualities, sizes and shapes. Offices have been completely rebuilt and rearranged.

♦

Northern Engineering Works, Detroit, maker of overhead traveling cranes, electric hoists, cupolas and special machinery, has appointed Wonham Inc., New York, to represent it in the New York area and also to handle foreign sales.

♦

Manning, Maxwell & Moore Inc., Bridgeport, Conn., has added two new sales representatives to its organization in the Texas oil field district. Fred Crabbe will cover the midland territory and Carl Davis, the Houston area.

♦

Bogert & Carliough Co., Paterson, N. J., manufacturer of steel windows and doors, is observing its fortieth anniversary this year.

♦

Allegheny Ludlum Steel Corp., Pittsburgh, has announced that it will award $2000 cash and a trophy to the Thompson trophy race winner who establishes a new speed record in the 1939 national air races in Cleveland this fall.

♦

Mutual Mfg. & Supply Co., Cincinnati, has been appointed a distributor of stainless steel tubing by Globe Steel Tubes Co., Milwaukee.

♦

Allen-Bradley Co., Milwaukee, has appointed Missouri Valley Electric Co., Kansas City, Mo., wholesale distributor of its motor control equipment in Kansas and western Missouri.

♦

Indiana Gas & Chemical Corp., Terre Haute, Ind., has completed a rehabilitation program costing about $100,000. Work included new stacks, relining of 60 ovens and general improvement.

♦

Hydro-Power Systems Inc. has been organized with complete facilities at Mount Gilead, O., for manufacturing hydraulic machine drives and component parts. The company holds many patents on hydropower developments.

LABOR

PITTSBURGH STEEL FOUNDRY REOPENS; WORKERS BEATEN

■ PITTSBURGH STEEL FOUNDRY CORP., Glassport, Pa., reopened last week after a 4-week shutdown, which followed company proposal to workers for a 15 per cent wage reduction. Three maintenance men were injured, one seriously, when attacked by Steel Workers Organizing committee pickets as they attempted to enter the plant.

LABOR BOARD ELECTIONS SET FOR TWO PLANTS

National labor relations board has set April 27 as date for elections for exclusive bargaining rights in Hubbard & Co.'s Butler street plant, Pittsburgh, and Westinghouse Electric & Mfg. Co.'s works at Derry, Pa. Steel Workers Organizing committee seeks certification in the Hubbard plant, while two unions, the United Electrical, Radio and Machine Workers and an independent union are contesting in the Westinghouse plant.

MEETINGS

A.F.A. NAMES INDUSTRIALIST AS CONVENTION LECTURER

■ BOARD of awards, American Foundrymen's association, has selected Fred H. Clausen, president, Van Brunt Mfg. Co., Horicon, Wis., to present the second annual awards lecture at the forty-third annual convention in Cincinnati, May 15-18. The lecture, with the title, "Business Management Has a Job," will be presented at the business meeting on May 17.

Mr. Clausen is vice president, Chamber of Commerce of the United States; a past president, Wisconsin Manufacturers' association; and board of regents, University of Wisconsin. He is chairman of the board, Holeproof Hosiery Co.; a director of Deere & Co.; and vice president of Farm Equipment i

The lecture was instituted to bring to members of th outstanding presentations eral business and industri lems.

INDUSTRIAL SAFETY TO FOR CHICAGO CONFERE

Seventeenth annual Midw ty conference will be held a Sherman, Chicago, May 9-11 sponsorship of the Greater Safety council in co-operati the Association of America roads, Illinois industrial com Institute of Traffic Enginee Keep Chicago Safe commit

Sessions of the conferen consider industrial safety, ca injured workers, use and lim of mechanical safeguards, d and correction of unsafe p in industry, and other pha safety.

Convention Calendar

April 24-28—American Mining Sixteenth annual coal convent exposition at Music Hall, Cin Julian D. Conover, 309 Munse ing, Washington, is secretary.

April 25—Wire association. F meeting at Hotel Bancroft, Wo Mass. Richard E. Brown, 1 Forty-second street, New Y executive secretary.

April 26-28—American Institute ing and Metallurgical Engineers. ty-second national open heart ference at Cleveland hotel, Cle John T. Breunich, 29 West Thirt street, New York, is executiv retary.

April 26-29—Electrochemical societ nual meeting at Columbus, C Colin G. Fink, Columbia uni New York, is secretary.

May 2—Association of Iron and St gineers. Joint meeting of Cle and Pittsburgh sections at Ohio Youngstown.

May 2-4—Chamber of Commerce United States. Annual meeti Washington. Ralph Bradford street N. W., Washington, is secretary.

May 4-5—Iron and Steel in (British). Annual meeting at I tion of Civil Engineers, Lond Headlam-Morley, 4 Grosvenor Ga London, S. W. 1, is secretary.

May 5—Wire association. Regional ing at William Penn hotel, Pitts Richard E. Brown, 17 East For ond street, New York, is ex secretary.

May 9-11—Midwest Safety confer Seventeenth annual conference a Sherman, Chicago.

May 15—Gray Iron Founders s Annual meeting at Netherland hotel, Cincinnati. C. I. Ritchie, 3 lic Square building, Cleveland, is tive secretary.

May 15-17—American Gear Ma turers association. Annual meet Hotel Cavalier, Virginia Beach J. C. McQuiston, 701 Shields bu Wilkinsburg, Pa., is manager-secr

May 15-18—American Foundrymen sociation. Forty-third annual co tion at Gibson hotel, Cincinnati. Kennedy, 222 West Adams street cago, is secretary.

May 16-17—American Steel Ware association. Thirtieth annual co tion at Drake hotel, Chicago. Doxsey, 442 Terminal Tower, land, is executive secretary.

chine Tool Electrification um Has Record Attendance

ORD attendance marked the annual Machine Tool Electrifi- forum held at Westinghouse c & Mfg. Co.'s East Pitts- works April 18-20. Conceived to speed up solution of engi- g problems in machine tool ectrical manufacturing indus- he forum has come to be rec- d by authorities in both indus- s a meeting place for mechan- d electrical minds, from which me substantial progress.

rger number of papers were ed by representatives of the ne tool industry. These indi- machine tool builders are in- to break away from tradi- methods, achieving important ction results and also creating for new electrical apparatus ater ruggedness, accuracy and ctness than ordinarily re- t.

essful electrification of a num- important machine tools by uilders developing the neces- special apparatus undoubtedly sulted in special switches, sol- s, and the like which will soon ed commercially in other ma- y.

eral papers dealt with broader s of machine tool design and ruction. For instance, a paper lded fabrication was presented . A. Maddux, welding super- Cincinnati Milling Machine incinnati.

other speaker who dealt with phases of design was Herbert gren, industrial stylist and de- consultant for the American ine & Foundry Co. By photographs and models he showed what proper styling can do to add to "self-selling" ability, and ease of maintenance of machine tools and other industrial equipment, often at little or no added cost.

J. R. Weaver, director of equipment, inspection and test, Westinghouse company, dealt with points considered in purchasing machine tools. He urged careful attention be given by builders to ease and speed setup, insertion and removal of work as well as cutting speed, to increase percentage of time devoted to actual cutting.

Wendell E. Whipp, president, Monarch Machine Tool Co. and president, National Machine Tool Builders' association, warmly commended the work being done through the forum and urged further efforts toward higher accuracy and finer finish of electrical equipment. Tell Berna, general manager of the association, spoke informally on sales engineering responsibilities.

Other speakers included: C. B. Stainback, R. S. Kersh, C. B. Connell, A. H. Jeywood, R. S. Elberty, W. E. Happel, T. R. Lawson, L. R. Botsai, W. D. Turnbull, W. F. Ridgway, R. W. Owens, G. A. Spohn, G. E. Hieber, Thomas Spooner, and Dr. Phillips Thomas. The forum concluded with a visit to the research laboratories, followed by a banquet.

Toy Plant To Increase Its Steel Consumption

■ Steel consumption by the Louis Marx & Co. toy plant, Glendale, W. Va., is expected to increase about July 1, when a $250,000 addition will go into operation. Gilmore, Carmichael-Olson Co., Cleveland, are the contractors.

The present plant consumes about 12,000 tons of 20-gage steel sheets annually, mainly in stampings. Marx officials estimate plant capacity will be increased about 65 per cent.

Construction was hastened by higher American duties placed on imports from Czechoslovakia, which have been a strong factor in the American toy market.

pecially interesting to many machine tool men who attended Westinghouse tric & Mfg. Co.'s forum on electrification last week was the motor production p. Illustrated is the shaft machining aisle, with conveyors for carrying parts to successive operations

Blast Furnaces Conserve Coal

■ BLAST FURNACE and coke oven operations are being influenced by the three-week suspension of coal mining in the Appalachian region. Eight furnaces and one battery of coke ovens were banked in the Pittsburgh and Youngstown districts last week "to conserve fuel supplies."

Actually, coal stocks of most iron and steel producers are adequate for several weeks operations, recent curtailment of consumption being a precautionary move in the event the strike is not settled as soon as expected.

However, scarcity of coal already is menacing operations of a number of smaller eastern consumers, and certain railroads report an acute shortage is approaching. Some eastern roads have turned to midwestern mines, which still are operating, to bolster supplies. Several coal-laden ore boats, waiting at Lake Erie docks for the opening of the ore carrying season, have been unloaded and the coal shipped inland.

Coal orders are reported to have been placed in Wales by some large eastern users. Meanwhile a number of smaller industrial consumers have found it necessary to turn to retail yards where it is necessary to pay a premium compared with prices formerly paid on carload purchases. Coke is being used in increasing amount for mixing with coal in an attempt to make stocks of the latter last as long as possible. Prices of beehive and by-product coke have not been affected by this situation.

While presidential intervention in the differences between bituminous operators and miners is counted on to terminate the suspension of mining, some interests regard settlement of the strike as still some way off, with the situation further clouded by the possibility of a stoppage in the anthracite region when new labor contracts come up for renewal May 1.

MEN OF INDUSTRY

■ V. H. LAWRENCE, formerly metallurgical engineer, Alan Wood Steel Co., Conshohocken, Pa., has been named assistant to the vice president. L. E. Ekholm succeeds Mr. Lawrence as metallurgical engineer. W. A. Ericksen has been made open-hearth superintendent, replacing A. F. France, who is now superintendent, steel division. P. C. Mayfield succeeds I. F. Wolfgram as coke plant superintendent, and the latter is now superintendent of coke plant and blast furnaces. W. B. Haus is blooming mill superintendent.

♦

Tom Addison has joined the Defiance Machine Works, Defiance, O., as chief designing engineer.

♦

C. N. Kirkpatrick has been elected a vice president, Landis Machine Co., Waynesboro, Pa. He will also continue as secretary.

♦

James S. Latucky has been appointed sales and advertising manager, Gilman Engineering Works, Janesville, Wis.

♦

George C. Brainard, president, General Fireproofing Co., Youngstown, O., has been elected a director, Addressograph-Multigraph Corp., Cleveland.

♦

Gus Wickstrom, since 1930 chief clerk in the purchasing department of Union Pacific railroad, has been promoted to assistant general purchasing agent.

♦

T. E. Nott, 122 Brevard court, Charlotte, N. C., and W. D. Taulman, 175 Spring street, Atlanta, Ga., have been appointed district sales representatives by United Conveyor Corp., Chicago.

♦

Robert E. Adams and W. G. N. Heer, research engineers, have joined Battelle Memorial institute, Columbus, O. Both have been assigned to the process metallurgy divison.

♦

David Pollock, Pottstown, Pa., has been appointed chairman, industrial relations committee, Institute of Scrap Iron and Steel Inc., New York. Barney H. Rubine, Hudson Iron & Metal Co., Bayonne, N. J., has been named vice chairman.

♦

Floyd M. Erlenmeyer, the past two years, western New York representative of Maas & Waldstein Co., maker of industrial finishes, Newark, N. J., has been transferred to the southern New York territory, with headquarters in New York city.

♦

Everett Michaels, Hyman-Michaels Co., Chicago, has been named chairman, and Edward L. Solomon, Max Solomon Co., Pittsburgh, vice chairman, finance committee, Institute of Scrap Iron and Steel Inc., New York.

♦

Carl Landgrebe, vice president, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been appointed a member of the new Alabama state board of agriculture and industries.

♦

Harlowe Hardinge, the past 16 years vice president and general manager, Hardinge Co. Inc., York, Pa., has been elected president. He succeeds H. W. Hardinge, who is now chairman of the board. F. E. Finch has been elected vice president and secretary.

Harlowe Hardinge

♦

Marvin Heidt, personnel director, Budd Wheel Co., Detroit, has resigned to become personnel director, Bendix Products & Aviation Co., South Bend, Ind.

♦

C. L. Dunbar was elected president, Cohoes Rolling Mill Co., Cohoes, N. Y., at the annual stockholders' meeting April 18. Other officers elected: Vice presidents, A. M. Mosley and A. Macfayden; secretary-treasurer, R. C. Poskanzer; assistant treasurer, C. D. Mauchan. Directors elected include: Messrs. Dunbar, Mosley, Macfayden, Poskanzer, W. P. Bayley, H. J. Fuller, and M. L. Jacob.

♦

H. C. Williams, formerly associated with the Patterson Foundry & Machine Co., East Liverpool, O., has been appointed sales engineer, the H. H. Robertson Co. at its Knox Co., of Pittsburgh, plant. He succeeds H. K. Porter, who has been appointed general plant superintendent, H. K. Porter Co., Pittsburgh.

♦

Dr. Arthur E. Bearse, and Howard Peters, metallurgists, have joined the technical staff of Battelle Memorial institute, Columbus, O. Dr. Bearse has been assigned to the industrial chemistry division and Mr. Peters to research in ferrous metallurgy.

♦

Ralph F. Peo, vice president, Houde Engineering Corp., Buffalo, has been made vice president and general manager, Heinze Electric Corp., Lowell, Mass., which has been purchased by Houdaille-Hershey Corp., Detroit, of which Houde is a subsidiary.

♦

Thomas A. Fernley Jr., retiring the National Wholesale Hardware association, Philadelphia, has been elected secretary of the Council of National Wholesale associations. He has been identified with the office of George A. Fernley the past seven years and has been a representative of the council since its formation several years ago.

♦

Alexander E. Walker, who resigned in STEEL, April 3, page 2, has been elected vice president and director of National Supply Co., Pittsburgh. He has been elected president, Spang-Chalfant Inc., Pittsburgh. Previous to joining National Supply, Mr. Walker served the Pittsburgh Steel Co. from Jan. 1, 1937, as executive vice president.

♦

W. R. Tracy has resigned as sales manager, Hudson Motor Car Co., Detroit. G. H. Pratt has been appointed general sales manager in charge of domestic and foreign sales and service operations of Hudson, and W. A. James has been placed in charge of the newly formed advertising and merchandising department.

♦

H. A. Wagner, one of the founders and for nearly 50 years president, Wisconsin Bridge & Iron Co., Milwaukee, has retired. He is succeeded by A. L. Riemer, heretofore vice president and general manager. J. A. Schoenecker, formerly secretary, has become vice president and E. F. Barkov, secretary. A. E. Harding, in charge of the Chicago branch, has been elected a vice president.

♦

Raymond Willey, vice president, Harbison-Walker Refractories Co., Pittsburgh, has been elected president, succeeding J. E. Lewis, who remains chairman. J. E. Magrukey Jr., general counsel, has

...to the new post of vice chair-
Vice presidents are: Ken-
eaver, P. B. Mossman and
Coolidge; treasurer, W. F.
secretary, P. R. Hilleman.

♦

k B. Conlon has joined Shef-
ss Co. Inc., Philadelphia, as
engineer, specializing in
and engineering with
lar reference to air condi-
heating and ventilating
He formerly was with the
ring department of Pennsyl-
railroad, Philadelphia, and
ith Airtemp Corp., Dayton, O.

♦

y Jude, since 1934 assistant
sales manager, locomotive
ent division, Manning, Max-
Moore Inc., Bridgeport, Conn.,
en promoted to general sales
er of that division. He suc-
. H. Butterfield, who recently
ade vice president in charge
s, industrial and locomotive
s. Mr. Jude, associated with
npany 33 years, started as an
oy.

♦

am A. Waldie has been ap-
technical research director,
Wrinkle Inc., Dayton, O. A
te of Harvard university in
try, 1908, he has been asso-
with the paint and varnish
ss since that time.

♦

. Mee was elected executive
president, and E. M. Bell,
rer, Cleveland Tractor Co.,
and, at a directors meeting,
0. Mr. Mee, who had been as-
d with the tractor industry
20 years, retired June 1, 1937,
president in charge of sales,
illar Tractor Co., Peoria, Ill.,
te his time to extensive citrus
gs in southern California.
officers re-elected: Chairman,
H. White; president, W. King
; vice presidents, J. G. Heaslet
J. Leisenheimer; secretary,
Higgins; assistant secretary
sistant treasurer, V. J. Sweet.

♦

neth C. Ellsworth has been
manager of Link-Belt Co.'s
n stoker division, with head-
rs in Philadelphia. Starting
3 as a dealer for Link-Belt
s, Mr. Ellsworth later joined
mpany's stoker department at
go. Subsequently he became
t representative in southern
ry; then was placed in charge
dwest stoker distributor sales,
n January, 1939, was trans-
to Philadelphia.

♦

ter B. Dodge, formerly gen-
ales manager, Stamford divi-
Yale & Towne Mfg. Co., New
has been appointed director of
are sales. He will have his of-

Henry Jude

fice in New York and will direct sales of the Stamford division; Sager & Barrows division, North Chicago, Ill.; Norton Door Closer Co. division, Chicago, and Canadian division, St. Catherines, Ont. Richard G. Plumley, works manager, Stamford division, has become general manager of Stamford, and Mark A. Miller, heretofore with the sales and executive departments, assistant general manager.

DIED:

■ JOHN G. OLIVER, 77, chairman of the board, Bardons & Oliver Inc., tool manufacturer, Cleveland, April 14 in that city. Mr. Oliver went to Cleveland in 1882, joining Warner & Swasey Co., and as head of its drafting room drew plans for the famous Lick telescope at Lick observatory, Mount Hamilton, near San Jose, Calif. In 1891, with George C. Bardons, he founded Bardons & Oliver, which acquired the Jos. Dyson & Sons Forge Shop in 1898, of which he was president at his death.

♦

William J. Taylor, vice president and production manager, Lamson Co. Inc., Syracuse, N. Y., conveyor manufacturer, in Syracuse, April 17.

♦

Victor L. Wright, 54, Cleveland representative, Chicago Flexible Shaft Co., Chicago, April 7 in Pittsburgh.

♦

Samuel R. Cohen, vice president, and one of the founders of Maremont Automotive Products Inc., Chicago, in that city, April 12.

♦

Edward Purnell, 95, father of Frank Purnell, president of Youngstown Sheet & Tube Co., Youngstown, O., in that city, April 14.

♦

Walter Bromley, assistant sales manager, American Screw Co., Providence, R. I., in that city, March 3. Mr. Bromley was associated with the company 40 years.

♦

Allston Sargent, 62, president, Sargent Metal Window Corp., New York, subsidiary of American Radiator & Standard Sanitary Corp., April 16 in New York.

♦

Walter Geil, 56, president, Reliable Plating Works, Milwaukee, in that city recently. Prior to becoming president of the plating firm in 1932, he was with Allis-Chalmers Mfg. Co., Milwaukee, 25 years.

♦

Frank Forrest Beall, 61, president and treasurer, Saylor-Beall Mfg. Co., Detroit, in Detroit, recently. He was a member, American Society of Mechanical Engineers and Engineers Club of New York.

♦

Charles P. Gribble, a pioneer in the forging industry for 38 years, and the past 20 years superintendent, forge division, Hayes Steel Products Ltd., Merritton, Ont., March 18.

♦

Herman M. Griggs, 78, from 1918 to 1937, manager, Ore and Coal Exchange, Cleveland, April 8, in Oakland, Calif., where he lived since retiring. Prior to becoming manager of the exchange, which he helped organize during the World war, he had been general ore and coal agent for the New York Central railroad.

♦

George C. W. Klippel, 53, manager, patent division, Republic Steel Corp., Cleveland, April 17 in Cleveland. Mr. Klippel joined the Elyria Iron & Steel Co. 25 years ago and at the time of the company's merger with Republic in 1930, he was credit manager. Since then he had been in charge of Republic's patent division.

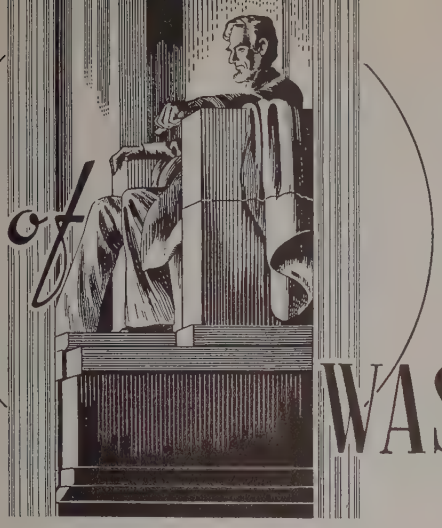
♦

Charles A. Ross, 56, president and general manager, Ross Operating Valve Co., Detroit, in that city, April 11. He was well known throughout the industry for his designing ability and was president of the company since its formation in 1921. Before that, in 1917, he was engineer in charge of building the plant of the Detroit Seamless Steel Tubes Co.

♦

Dr. Clarence F. Hirshfeld, 58, chief of research, Detroit Edison Co. since 1913, in Detroit, April 19. He was internationally known for his work in engineering, research, education and science, and many of his technical writings are classics in their fields. Dr. Hirshfeld was awarded the Worcester Reed Warner medal of the American Society of Mechanical Engineers in December, 1937.

ASSOCIATED COMPANIES: DAVY AND UNITED ENGINEERING COMPANY, LTD.



Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

ATE military affairs com- last week reported out the rd bill authorizing the secre- war to exchange obsolete, ble and unserviceable ma- and tools for the manufac- repair of ordnance *materiel* w machinery and tools.

object is to make possible g in present tools and pay- h for the difference between dit on the old machines and nes, instead of scrapping the

letter to Senator Sheppard, an of the senate military af- committee, the war secretary existing law will be affected bill.

ing the last session of con- the secretary stated, "a pro- was initiated for the procure- of machine tools and equip- necessary to modernize facili- the various ordnance manu- ng establishments and to pro- uch additional equipment as e necessary to a view toward production of work *materiel* event of a national emerg-

lakes Possible Economies

is believed that the congress ontinue this program in the t of national defense, and in that the greatest economies in ement may be effected, it is ble to trade in for new equip- such unserviceable or unsuit- ools as are now in the hands various ordnance establish-

large number of machine are over 20 years old and un- to modern mass production ds. If these tools are disposed unsuitable for further use the ment would realize little more their value as scrap material. this bill be enacted into law, change value to machine tool rs would undoubtedly be r than could be realized by a cash sale made by the government. Accordingly, it is recommended that early action be taken toward enactment into law of this bill."

LABOR ACT HEARINGS TO BE RESUMED APRIL 24

Hearings on proposed Wagner act revisions before the senate education and labor committee were adjourned in the middle of last week and will be resumed April 24. At that time, it is expected officials of several government departments will be heard.

Witnesses last week included those both for and against amendments to the act. Senator Burke, Nebraska, and Senator Holman, Oregon, and Representative Hoffman, Michigan, asked amendments to the present law. J. Warren Madden, chairman of the labor relations board, appeared in defense of the present act.

Senator Burke, one of the outstanding foes of the NLRB, minced no words before the committee. He charged the labor law is being administered by a biased and unfair administrative agency. The senator, who has a number of amendments pending in the upper chamber, placed great emphasis on the suggestion present board member retire by Feb. 1, 1940, and their places be filled by three new members, one representing employes, one representing employers, and the third representing the public. He cited statements made sometime ago endorsing such a plan by AFL's William Green, CIO's John L. Lewis, and Secretary of Labor Perkins.

Senator Burke speaking:

"The long range objective in proposing these amendments is the same as congress had when the present act was passed. That is, peace in industrial relations; peace with fairness and mutual satisfaction and understanding; peace founded upon goodwill and democratic processes. If peace based upon reason is to be established and to endure, it must be a just peace. The law which seeks thus to encourage peace must be scrupulously fair to all who are affected by it. I know there is a fashion current among blind partisans of the present act and its administrative board to make light of the suggestion that anything need be done to make this law fair. Let me remind them that there are major powers in the world today which have contempt for fair laws. Those in authority there have imposed their own ideas of labor peace. I do not believe that we should follow their example into that kind of labor peace . . . .

"In human relations—and labor relations are human relations—any suggestion of tainted justice is fatal. There is, unfortunately, more than a suspicion of a lack of even-handed justice in the present labor act and the present board."

Board Chairman Madden fought back at the opponents and denounced them as "bitter enders" who opposed the original enactment of the law and who have never become reconciled to the "liberties which it confers upon American workmen and who now urge the congress to take away those liberties."

DEFENSE MEASURES ARE APPROVED BY CONGRESS

Congress is granting authorizations and making definite appropriations for various national defense items. Senate has approved establishment of a new military aircraft research center, passed the second deficiency bill carrying appropriations amounting to $152,000,000, most of which was for national defense. The senate overrode its appropriations committee by adding to the bill $4,000,000 to begin construction of an aeronautical laboratory at Sunnyvale, Calif., which will cost, when completed, about $10,000,000.

House merchant marine committee approved a bill calling for an appropriation of $277,000,000 to con-

struct additional locks for the Panama Canal, which would assure quicker fleet movement between the Atlantic and Pacific.

War department officials were called before a subcommittee of appropriations of the senate military affairs committee, and testified in executive session on various phases of the defense program prior to action on the $513,000,000 army supply bill.

HOPKINS' ILLNESS BRAKE TO COMMERCE DEPARTMENT

Rumors recur in Washington that Harry Hopkins will be forced to resign as secretary of commerce because of illness. These whisperings are being somewhat discounted by the fact the President knew when he appointed Mr. Hopkins a member of his official family that the latter was far from a well man. Mr. Hopkins' illness is probably no worse than had been anticipated. However, he has not been at his office in the commerce department more than half the time since he entered the cabinet.

In the meantime, work at the department is almost at a standstill because no one there seems to know what Hopkins' policies are or what they will be.

In the meantime, Edward J. Noble, who recently resigned as chairman of the civil aeronautics authority, has been "sitting in" for Mr. Hopkins, who has been out of town for a rest. Mr. Noble, however, in his capacity as a dollar-a-year man is not able to sign official mail and conditions at the department are at loose ends.

Recent reports the reconstruction finance corporation will be put under the commerce department and Jesse Jones, RFC head, would take Mr. Hopkins' position as secretary of commerce were called "just another story" by President Roosevelt in his Friday press conference. The President said plans for reorganizing government departments probably would be forwarded to congress within next ten days or two weeks.

FIND "MISUNDERSTANDINGS" ON BARTER PROPOSAL

State department officials say inquiries indicate there is misunderstanding on the suggestion made by Senator Byrnes and the department for the proposed exchange of raw materials for stocks of strategic materials.

Fears are expressed in some quarters markets for the commodities would be upset and prices depressed. Furthermore, comparing the plan with commercial barter deals, it is contended by many that the trade agreement program is being abandoned and commercial policies reversed.

Government officials are pointing out this government is not seeking to force American surplus commodities into the world's markets by any scheme to exchange or barter them for strategic materials. It is contended that American surpluses will be available for exchange only if foreign governments are interested in acquiring them for war reserve stocks.

It is said the idea now being explored is confined to the acquisition of strategic materials and these materials only as reserves for national emergencies.

STUDY SHOWS ADVANTAGES OF TRADE AGREEMENTS

During 1936, 1937 and 1938 imports into 16 countries with which the United States has reciprocal trade agreements showed a much larger rate of increase from the United States over two pre-agreement years, 1934-1935, than imports from Germany, the chief exponent of barter, clearing, compensation, or similar trade programs, a government study shows.

Imports from the United States into the 16 countries with which reciprocal trade agreements were in effect prior to 1938, experienced an average increase of approximately 39.8 per cent in value in the past three years over the two years 1934-1935. Imports into the same countries from Germany increased only about 1.8 per cent in value.

PREDICTS COMMODITIES CLAUSE WILL BE KILLED

Senate committee on interstate commerce Thursday appointed a subcommittee, Senator Wheeler, Montana, chairman, to work out details of S-2009, which is the principal railroad bill now pending.

This is the bill which contains the so-called commodities clause dealing with railroads which are subsidiaries of industrial corporations. Senator Wheeler expressed his opinion that the commodities clause will be stricken from the bill.

DEFENSE PROGRAM ON CHAMBER'S AGENDA

Key note of the twenty-seventh annual meeting of the United States chamber of commerce in Washington, May 1-4, will be recovery, but in view of the expanding national defense program of the government, industry's part in this program will have a large part.

In view of the expanded defense program, the chamber will have a special round table session which will be given over to a discussion of industry's part in such a program, particularly as respects industrial mobilization and strategic war materials.

Col. J. H. Burns, executive officer to the assistant secretary of war, will explain what manufacturers would be called upon to d of war, while Walter C. C A. Pierce & Co., Detroit, wi providing strategic war r There will be a general disc these and related subjects the talks at which war and partment officials will be During the course of the co also, there will be a meeti national defense committe national chamber.

GOVERNMENT IRON, ST AWARDS TOTAL $1,075,03

During the week ended the government purchase 035.81 worth of iron, steel products under the Wals act as follows: Walter Kid Inc., New York, $25,263; Locomotive Co., Schenectad $26,087; The Kinnear M Columbus, O., $19,858; Pipe & Steel Co. of Calif., S cisco, $28,965; Bethlehem S Bethlehem, Pa., $13,465.0 mated); Colorado Fuel a Corp., Denver, Colo., $11,64 Virginia Rail Co., Hunting Va., $60,116.18 (estimated negie-Illinois Steel Corp., Pit $17,798.73; Youngstown Sh Tube Co., Youngstown, O., $1 Carnegie-Illinois Steel Corp ington, $16,350 (estimated Moor Iron Works Inc., Edg Del. $176,522; Industrial P Engineering Co., Baltimor 395; C. C. Moore & Co., en San Francisco, $169,023; Iron Works Inc., New York, Republic Steel Corp., Can $45,622.40; Crucible Steel C York, $28,116.97; American Ltd., Honolulu, T. H., $22 Widin Metal Goods Co., G N. J., $9,922.50; and Chicago & Iron Co., Philadelphia, $13

ARNOLD TO TELL ATTITU ON ANTITRUST ACTION

Assistant Attorney Genera man W. Arnold will addr American Trade association tives at a conference to be he May 1. He will discuss the of the antitrust laws to methods of production and d tion and the problems whic conditions impose on busine government.

Questions involving busine duct through the application Sherman act have troubl branches of business, and it derstood that Mr. Arnold wil an effort to give the trade exe the present attitude of the department on this subject.

Included in the program meeting is a talk by L. M Walling, administrator of th sion of public contracts, wh discuss the importance of the Healey act to American indust its relation to the Trade asso

...ATION

...'S AIRCRAFT INDUSTRY'S ...IN PLANT EXPANSION

...V rapidly could America's air-...dustry expand its production ...y in event of a national emer-... Demonstrating is Glenn L. ... Co., now building a 440,000-... foot, $1,850,000 assembly ...ddition at Middle River, Md., ...mpletion scheduled for May ... 11 weeks after ground was ...

...s work in three 8-hour shifts, ...achinery and equipment cost-...0,000 is being installed while ...uction is in progress. ... extension will give Martin ...ntry's largest single-unit air-... plant, 1,097,000 square feet. ...mpany expects to employ 10,-... the close of 1939, compared ...600 at present. Its backlog ...xceeds $39,000,000, is highest ... industry.

...s for a $250,000 plant expan-...re announced by McCauley ...n Corp., Dayton, O., maker ...el propellers. Program will ...se annual output from 900 to ... nits.

...glas Aircraft Co. Inc. is pre-... to construct a 200 x 250-foot ...oly addition to its Santa Mon-...alif., airplane factory. Bids ...been received by Consolidated ...ft Corp., San Diego, for a ...00-foot extension to its plant.

Metalworking equipment is to be installed.

Chance Vought division, United Aircraft Corp., Stratford, Conn., last week received a $2,103,800 navy contract for airplanes and spare parts. Navy also made awards for engines to Pratt & Whitney division of United Aircraft, East Hartford, Conn., $570,691; and Wright Aeronautical Corp., Paterson, N. J., $20,667.

War department has purchased two all-metal experimental planes; one from Bell Aircraft Corp., Buffalo, the second from Seversky Aircraft Corp., Farmingdale, L. I.

Army Orders Accessories

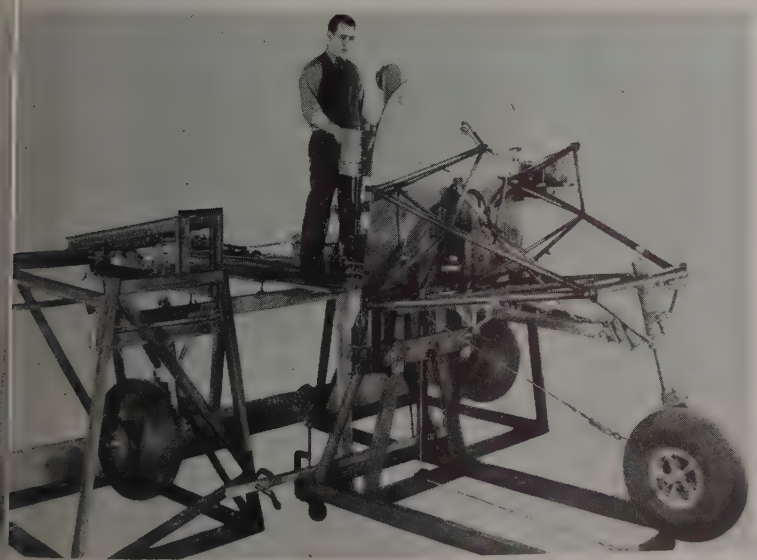
Other recent air corps orders: Pollak Mfg. Co., Arlington, N. J., bomb shackle and flare rack assemblies, $23,810; Fairchild Aerial Camera Corp., Jamaica, L. I., camera assemblies, $22,500; and Longines-Wittnauer Watch Co. Inc., New York, chronometers, $16,750.

Brewster Aeronautical Corp., Long Island City, L. I., last week concluded an agreement with Consolidated Aircraft Corp. whereby Brewster will acquire all design rights, technical data, production jigs and fixtures for nine types of military training and observation planes formerly manufactured by Consolidated.

Pump Engineering Service Corp., Cleveland, manufacturer of aircraft pumps and accessories, has been acquired by Borg-Warner Corp., Chicago, and will operate as a branch. Pump Engineering's capital is to be increased to $2,000,000, and its plant will be expanded.

Revolutionary is the new "reversible pitch" propeller just announced by Curtiss Propeller division of Curtiss-Wright Corp., Clifton, N. J. Normal blade angle may be reversed on this propeller to create a negative thrust, effectively "braking" an airplane in flight. Unit also will improve control of large multi-motored craft during ground or water taxiing, aiding in quick turns and other maneuvers.

Test New Landing Gear in Steel Frame



...ydraulic retraction mechanism of the new "tricycle" type landing gear is tested ...ega Airplane Co.'s Burbank, Calif., plant by simulating takeoffs and landings ... gear suspended in this specially-designed steel frame. Raising and lowering of the wheels is controlled and timed from platform at top

Officers Elected by Warehouse Chapters

■ Eight chapters of the American Steel Warehouse association have elected officers for the coming year, as follows:

Baltimore: President, H. A. Lowry, Seaboard Steel & Iron Corp.; vice president, T. P. Walker, J. B. Kendall Co., Washington; secretary, Eugene Mowlds, Scully Steel Products Co.; national director, George J. Parke, Eagleston-Parke Inc., Norfolk, Va.

Buffalo: President, E. J. Wichter, Edgar T. Ward's Sons Co.; vice president, J. Comer, Dobbie Foundry & Machine Co., Niagara Falls; secretary-treasurer, W. B. Huntley, Brace-Mueller-Huntley Inc., Rochester; national director, W. H. Kline, Burke Steel Co. Inc., Rochester.

Pacific Northwest: President, H. F. Morrow, Pacific Metal Co., Portland; vice president, William R. Case, Seattle Steel Co., Seattle; secretary-treasurer, Everett W. Hawkins, Portland; national director, John B. Robbins, A. M. Castle & Co., Seattle.

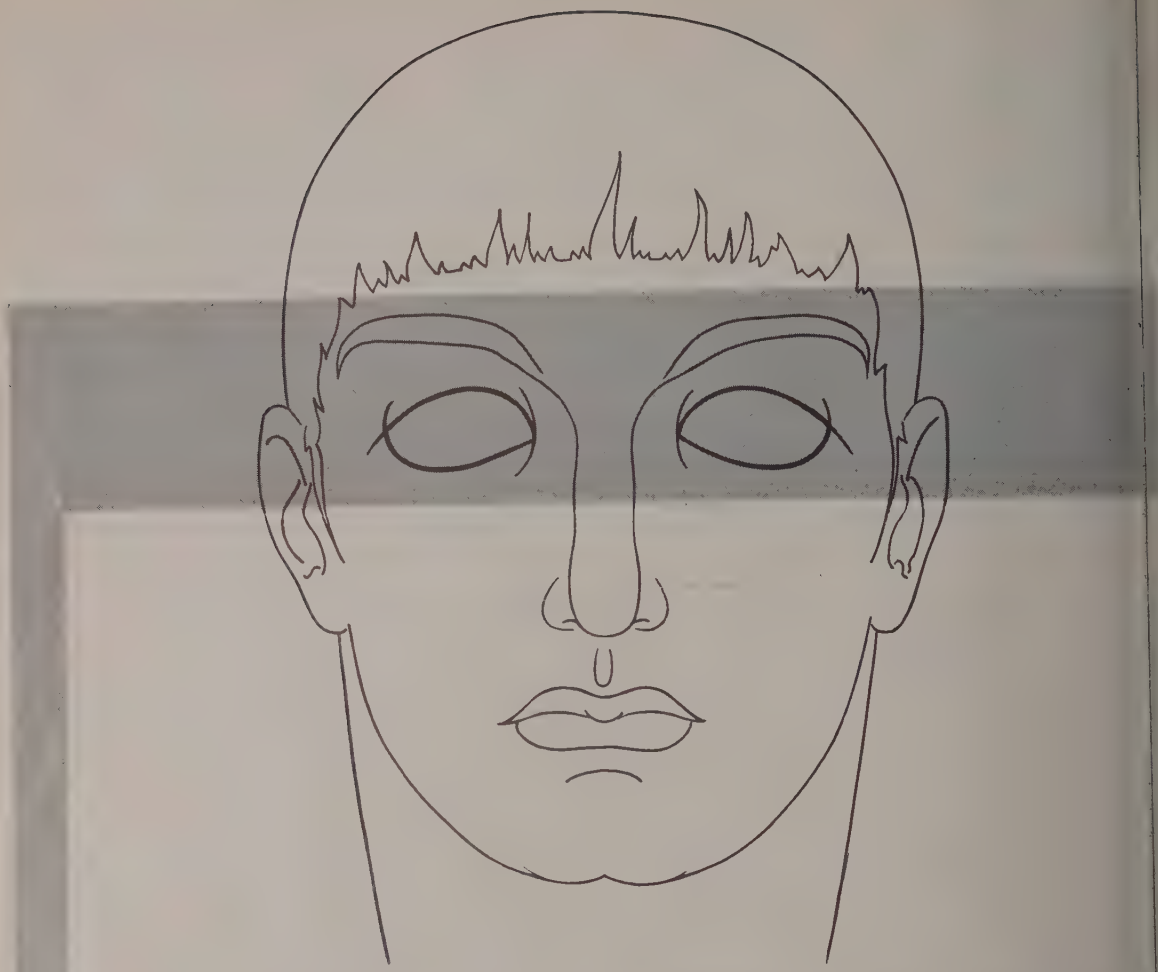
Philadelphia: President, J. W. Patrick Jr., Peter A. Frasse & Co. Inc., vice presidents, L. Norris Hall, L. Norris Hall Inc., and Leslie Edgcomb, Edgcomb Steel Co.; secretary-treasurer, James J. Collins, L. Norris Hall Inc.; national director, A. C. Allshul, Joseph T. Ryerson & Son Inc.

Connecticut: President, R. B. Shearer, C. S. Mersick & Co., New Haven; vice president, S. H. Hascall, Blodgett & Clapp Co., Hartford; secretary-treasurer, G. S. Brousso, C. S. Mersick & Co. Mr. Shearer will also serve as national director.

New England: President, P. F. Avery, Avery & Saul Co., South Boston; vice presidents, M. C. Harvey, Arthur C. Harvey Co., Allston, and Quincy W. Wales, Brown-Wales Co., Boston; secretary-treasurer, J. B. McIntyre, Scully Steel Products Co., Allston; national director, Richmond Lewis, Charles C. Lewis Co., Springfield.

New York: President, M. W. Faitoute, Faitoute Iron & Steel Co., Newark, N. J.; vice president, P. O. Grammer, Grammer, Dempsey & Hudson Inc., Newark, and W. C. Hughes, Bright Steel Corp.; secretary-treasurer, Charles Kramer, Scully Steel Products Co., Newark. Mr. Grammer will also serve as national director.

Northern California: President, M. S. Donaldson, A. M. Castle & Co., Oakland; first vice president, J. R. Winzeler, Federal Pipe & Supply Co., San Francisco; second vice president, H. E. Oliphant, Tay-Holbrook Inc., San Francisco; secretary, R. D. Cortelyou, San Francisco; national director, Howard M. Taylor, Spotswood Co., San Francisco.



BLIND MEN NEVER GO TO TRADE SHO

BUT your present and prospective customers do go to see new materials, new products, and new processes that are on display in the show windows of industry and business . . . the trade shows.

The buyers from every industry, from Automobile to Zylonite, constantly watch for new developments. We find them studying new products . . . seeking information . . . comparing . . . considering, and placing orders.

Exhibits that are interesting,—well planned,—that dramatize your sales message,—produce results.

Gardner Displays specialize in the design and construction of effective trade show exhibits. New ma and processes developed by Gardner Displays the preparation of over 60 outstanding exhibits World Fairs are available to you.

Whether you require a small or large exhi invite you to discuss your problem with us. A from you will bring a description of the latest de ments in this field. Write for our free monthly pu tion, "Industrial Showmanship." It contains inte information about this rapidly-changing meth visual selling.

GARDNER DISPLAYS

PITTSBURGH	NEW YORK	DETROIT	CHICAGO
477 Melwood St.	42-50 21st St., L. I. City	New Center Bldg.	1130-A Mdse. Mart

Mirrors of MOTORDOM

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

OMOBILE companies would ot if they could locate a de- e rain *unmaker* who might tched to key cities in the and put a stop to the in- weather which appears to ng back the normal volume g auto sales. In the past weeks cold and dampness xacted a heavy toll from toll which may not be re- later in the spring.

es for the first ten days of while comparing favorably same period last year, are anticipations. Buick dealers 39 units, a gain of 42 per er last year. Pontiac's total 38, or 73 per cent over last the same time. These two rs probably exceed the show- le by some others.

ould not be concluded that bile sales have gone sour ely. It is just that some easi- s developed which was not d. A few favorable political, tional or meteorological de- ents could swing the trend er way in short order.

sler divisions are stepping ases for April, May and June, n to continue assemblies of dels into the summer as long il demand lasts. From pres- lications there will be no early over to 1940 models by Chrys- l when the changeover does t will be of short duration. odge planning division cur- is working evenings until cause of increased produc- hedules ahead. In numerous orders have been issued to acations over by June 1.

REASINGLY it is becoming that efforts to knit to- a fourth combination of companies have progressed rably beyond the mere rumor stage. Latest behind-the-scenes reports mention Packard, Studebaker, Nash, Willys and Reo as proposed units. Such a group would provide a complete line of passenger cars from the lowest-priced to the highest, as well as Reo's facilities for truck and bus manufacture. Naturally a lot of underbrush has to be cut away before the path is clear to any such merger, but it seems a foregone conclusion the automotive pace today is so intensely competitive that profits are next to impossible for the independent manufacturer except in so-called boom years. It has been argued the independent manufacturer is essential to insure progress in new designs, to pioneer new styling and mechanical innovations. It has been said the large-volume manufacturer cannot afford to take chances on new ideas because of the danger of unforeseen service failures or of refusal by the buying public to accept them. If the remaining independents were swallowed up into a fourth combine, the problem would become all the more intensified as far as pioneering radical style changes is concerned, but important savings might be

Electric Welded Pipe Used for Car Lifts

■ Electric welded pipe serves as lift cylinder and piston for hydraulic automobile hoists manufactured by United States Air Compressor Co., Cleveland. Cylinder is a 12¾-inch section while piston is 10¾ inches in diameter. In background of photo, a piston section is being ground, tolerance of 0.0001-inch, in foreground a similar section is being tested by air pressure, 175 pounds per square inch, primarily to check the heads which are welded into the ends of the column. Pipe is manufactured by Republic Steel Corp., Cleveland

realized from the amortization of die costs by several producers rather than by one, and by the interchangeability of parts which would be possible.

Solution to the problem of pioneering innovations then could be solved by each of the four corporations designating one of its lines as a sort of proving ground or "pilot" line which would feature new ideas as they came along. Naturally these "pilot" lines would be ones which normally did not involve high production during a year's run, ones on which it would be feasible to let engineers and designers have a free hand, so that successful and popular changes, as proved on these models, could in turn be adopted on the other cars in the line.

The above lineup leaves out Hudson, Hupmobile, Graham and, of course, the various truck companies. Whether Hudson will consider casting its lot with such a proposed consolidation or whether the long-rumored "connection" between Hudson and Ford would preclude this remains to be seen. It should be remembered the consolidation as outlined here still is a long ways from consummation, but at least a certain group of business men in this district are working on the proposition, with the moral assistance of certain Wall street interests. There is no indication as to how soon any real progress will be achieved.

Difficulties in Path

Numerous obstacles must be surmounted. One that comes to mind is the current dispute among Reo stockholders and officers about the future status of the company. A proxy fight is looming up again as the former management is contesting the fitness of the present management; a meeting scheduled for April 26 may throw more light on this altercation. If the policies of the present management are vindicated, it is considered likely Reo may enter the passenger car field again in the fall.

The future status of Graham in this promotional effort seems to be more in the direction of aligning with one of the present integrated companies, Chrysler for example, in which it could be established as the "proving ground" mentioned previously. This would leave Hupmobile to work out its own destiny, unless you would want to consider it as a possible "pilot line" affiliate of General Motors.

Here, in a nutshell, is the way one group of forecasters has worked out the future of the automobile industry. Four big, happy families, each one making money, each one successfully pioneering successive improvements in design and mechanisms, each one employing hundreds of thousands and yielding handsome returns to contented stockholders. Contemplating the lineup, some hardbitten observers shudder to think of the conflicting personalities which would have to be subdued, of the many jobholders who would necessarily be dislocated, before such roseate goal is reached.

■ THOSE who have seen the new Ford tractor are unstinting in their praise of the many novel features incorporated in it. The unit is reported to be an adaptation of the tractor unit produced in England by the Harry Ferguson organization and known as the HF tractor.

No official announcement has been made by the company as to when production will be started or as to when buying of materials and equipment for production will be initiated. An extensive program of improvement in the Ford foundry, now under way, may be for the purpose of facilitating production of castings for the tractor. Five new electric furnaces, 10 tons and under in capacity, will be installed shortly; two new forehearth cupolas, a new sand handling system, a dust collection system and other equipment will go in simultaneously. Steelwork has been let for a 3-story addition to one section of the foundry building to accommodate hoppers for the sand handling system. This work is figured to be completed in two months.

The main feature of the HF tractor is the method by which the implements are mounted di... the rear axle of the tra... By means of gearing and o... degree of "bite" of the plow implement is controlled a... ally, so that when wo... ground of irregular con... plowshare always main... same depth. Further if t... ment should strike an ob... instead of the front whee... tractor being lifted off th... with danger of tipping, ... wheels lift and spin until t... is reduced, the tractor b... and the implement raised ... ically.

The new tractor is repu... about 1000 pounds lighter ... unit which Mr. Ford was ... through its paces last yea... the same time shows appro... 50 per cent better econon... said to be capable of uphill ... in sandy soil, something wi... a little beyond the capacit... first design. Engine is of th... der type, with 3¾-inch bo...

Price of the English trac... three implements, is abou... No price has been determin... ally for the Ford tractor, bu... likely be about half that fig...

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	227,130	353,946
Feb.	383,900	202,589	312,141
March	519,022	238,598	.....
April	553,231	238,133	.....
May	540,377	210,183	.....
June	521,153	189,399	.....
July	456,909	150,444	.....
Aug.	405,072	96,936	.....
Sept.	175,630	89,623	.....
Oct.	337,979	215,296	.....
Nov.	376,629	390,350	.....
Dec.	347,349	407,016	.....
Year	5,016,437	2,655,777	.....

Estimated by *Ward's Reports*

Week ended:	1939	1938†
March 25	89,400	56,800
April 1	85,980	57,500
April 8	87,019	60,975
April 15	88,050	62,021
April 22	90,280	60,563

†Comparable week.

	Week Ended	
	April 22	April 15
General Motors	34,405	34,680
Chyrsler	23,625	20,725
Ford	21,480	22,230
All others	10,770	10,415

■ MOTOR companies are ... to beat the drums to call a... to their pretentious exhibits ... New York fair. Last Tuesda... eral Motors received 600 n... in New York and loaded the ... special train which took the ... directly to the fair ground ... preview of the corporation's ... ways and Horizons exhibit, ... pany with top GM officials. (S... page 32).

The Chrysler exhibit has ... unusual features, including ... foot polaroid mural, giving ... sion of constant motion; t... mensional moving pictures; a... forest containing trees buil... thin sheet metal with refr... inside them to build up a ... covering of frost; Lady God... other historical characters ... would appear if they had ri... automobiles; a "magic" ca... answers questions and obey... mands apparently "unaided ... human hand."

Studebaker is spending $... to send a special flying squa... sales promotion experts arou... country to supervise showing ... company's film "Ahead ... Parade," depicting the dram... dent to development of the ... baker Champion model. The ... cover 200,000 miles, it is esti...

First shipments of the new ... Skylark models to distributo... dealers were made last week. ... duction will be stepped up ... according to President S. L. ... and all models will be availa... the middle of May.

ET THAT DIRT

BEFORE IT GETS YOU!

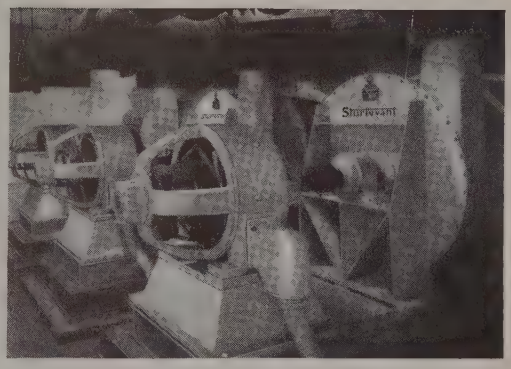
KLING dust and dirt with brushes or brooms is pretty ch of a hopeless job. Despite the eternal struggle of the ng crew—much of the dirt is simply stirred up and settles —collects on piping and in other hard-to-reach places— to costly machinery.

aste time with this slow, expensive, ineffective method ning? GET THAT DIRT with a Sturtevant Vacuum r—before it gets you!

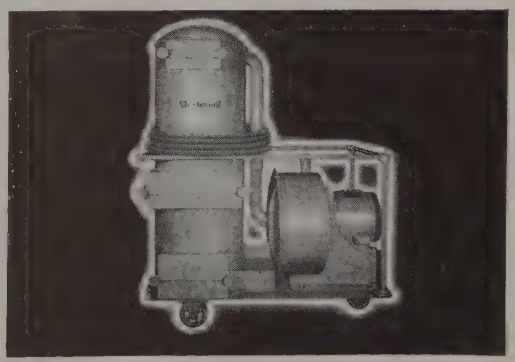
owerful suction of a Sturtevant Vacuum Cleaner gets all st and dirt—sucks it right into the dust collector, where t blow around and settle again. Any valuable dust drawn e dust collector can be easily reclaimed. There is no es- r dust and dirt anywhere—on the floors, walls, ceilings,— ers and crevices, on piping, in bins, shelving and machin- ou get at it—and get it all—with a Sturtevant Cleaner.

for Sturtevant catalog containing full information. Stur- Vacuum Cleaners are available in portable and central types for every industrial service.

TURTEVANT COMPANY Hyde Park, BOSTON, MASS.
es in 40 Cities
B. F. Sturtevant Co. of Canada, Ltd.—Galt, Toronto, Montreal



Sturtevant Central Vacuum Cleaning System—showing dust collectors and vacuum producing machinery.



Sturtevant Portable Heavy Duty Industrial Type Vacuum Cleaner.

Sturtevant
REG. U. S. PAT. OFF.
Puts Air to Work

WORLD'S LARGEST MAKER OF AIR HANDLING EQUIPMENT

No More Frontiers? Industrial Leaders See New Era of Expansion

■ "WE HAVE only begun to expand our industrial frontiers," declared Alfred P. Sloan Jr., chairman, General Motors Corp., at a preview "Highways to New Horizons" dinner at the New York World's fair last week.

Basis for Mr. Sloan's statement was a symposium on significant recent accomplishments of industrial research, contributed by a hundred industrialists. The survey included many fields—steel, machinery, chemistry, motors, aviation and others—and indicated new products and new processes within the past several years have created more employment, contributed to better living for all.

Five hundred industrial and civic leaders were guests at the dinner, officially dedicating General Motors' exhibit at the fair, and heard Mr. Sloan and Charles F. Kettering, General Motors research chief, envision the part industry will play in the nation's rebuilding.

Each guest was given a booklet containing an industry-by-industry symposium of new research developments. Metal producing and metalworking leaders predicted a continuing procession of new steels, new partnerships of metals to perform new tasks, development of domestic sources of essential metals now imported.

One of the most outstanding developments in the steel industry, to which all major sheet producers have contributed, wrote E. G. Grace, president, Bethlehem Steel Corp., has been the development of high-quality, deep-drawn steel sheets which have made possible the fender and the all-steel top of the modern automobile. Mr. Grace also cited a new process of electrolytically zinc coating, and apparatus for rapid determination of resistance of commercial steels to atmospheric corrosion.

Better Rolling Processes

E. T. Weir, chairman, National Steel Corp., and Charles R. Hook, president, American Rolling Mill Co., commented on the development of better continuous rolling processes which have made possible a better sheet for the manufacture of automobiles, refrigerators, radios and other articles that require this grade of steel.

Republic Steel Corp., according to Chairman T. M. Girdler, has made "great advances in strip and sheet production by installing the largest continuous strip mill in the world, and greatly advanced the production of tin plate by the cold reduction process, as well as electro-galvanized wires, stainless steel, electric weld pipe and other products.

President Frank Purnell, Youngstown Sheet & Tube Co., mentioned his company's nickel-copper high tensile steel "which meets successfully the requirements of our modern high-speed age."

"In the interest of social and economic progress," explained B. F. Fairless, president, United States Steel Corp., "the steel industry offers the recently developed high-strength steels, corrosion-resistant and workable-cold, making possible the production of lightweight moving equipment. . . . This paves the way for the realization of economies in operation amounting to millions of dollars annually."

New Alloys Aid Machining

Inland Steel Co., according to President Philip D. Block, has found that "by the controlled addition of small quantities of lead, both carbon and alloy steels can be machined 30 to 50 per cent faster . . . without any sacrifice of other physical properties to interfere with susceptibility to heat treatment."

Campbell, Wyant & Cannon Foundry Co. comments on recent "refinements in metallurgical processes for casting proferall crankshafts, camshafts, centrifuse brake drums and sleeves, and new alloyed steels."

"Amola" is reported by Chrysler Corp. General Motors notes new bearing materials of copper, lead, cadmium, silver and idium, powdered metallurgy.

Edward G. Budd cites fabrication by welding. General Electric lists "Almico," providing permanent magnets twice as strong as any prior material. Fletcher W. Rockwell, president, National Lead Co., reminds of titanium developments.

"Nickel's contribution to the greater convenience of mankind lies in its participation in the development of modern alloys," says Robert C. Stanley, president, International Nickel Co. of Canada Ltd. "The development of a commercially-successful process for concentrating low-grade manganese ore by the Cuban-American Manganese Corp.," is cited by Langbourne M. Williams Jr., president, Freeport Sulphur Co. This "foreshadows a day when the American steel industry will be as independent of foreign supplies as it is of supp ore."

Research has made po alloys available for die c cording to Marshall L. H Jersey Zinc Co. Lates ment of the Doehler Die C "is in the field of die-cas nesium," reports Chairm Doehler. Anaconda Copp Co. lists "thin copper widths and lengths availa ing which are produced b deposition."

Diesel engines are cited ing equipment advance by "We have put an inves $25,000,000 to work in o program. Some 4000 new been created and the indu is in its infancy."

High-lift pumping units water from Boulder dam t geles are noted by Preside Beaver, Worthington Pum chinery Corp. Charles E. director, Baldwin Locomoti and E. P. Bullard, presi Bullard Co., cite conspic vances in machinery and tools.

Norton Co. believes a wheel, the rim of which with crushed diamonds bon metal, is one of its most si recent developments.

Fifteen-Ton Hamm Drive 100-Foot Piles

■ Unusually heavy are drive hammers being con for Merritt-Chapman & Sco New York, for use on the s ture of the Potomac river b tween Ludlow Ferry, Md. point near Dahlgren, Va. Mcl Terry Corp., New York, h awarded contract for the ha which will have 14,000-poun

Total weight of each h with special anvil blocks f ing fabricated steel piling, 15 tons. Each will deliver an of 36,000 foot pounds, at a 55 blows per minute. Speci signed for underwater drivi hammer stays on the piling t tration under 90 feet of wat

One of the new hammers mounted on a special boat, and rigged to carry at the pile driver frame. Derrick, ha guide and bracing will weig than 200 tons, will permit 100-foot steel piles.

■ Value of shipments made ruary by 99 manufacturers of lain enameled products was 783, a gain of 11 per cent ov comparable figure for Janua 383,192.

ew Deal Policies Arrested March
$100,000,000,000 Income"—Weir

ERICA'S national income ...be well in excess of one hun... billion dollars annually if the ...t economic progress of the ...0 years had not been arrested ... past decade, declared E. T. ... chairman, National Steel ... speaking at the Weir-Cove ...er of commerce meeting, ...n, W. Va., last week.

Weir placed blame for the na... failure to reach new high lev... prosperity on action and pol... the national administration, he said, have destroyed the ...nce of business men and have ...cted the new private invest... essential to recovery.

...s administration can, if it will, ...he country back to real recov... he asserted.

...ever, he expressed doubt that ...ary action would be taken be... recovery would remove the ...for excessive public spending ...t which "the White House ... will not have the political ... to drive through to a conclu... their private plans for an econ... of centralized power in the ...d States."

...ent points in Mr. Weir's ad...

... the 150-year period before 1929, production, income and living standards moved steadily upward. After each depression the country attained and held higher standards than before.

The years since 1929 represent the first period of that length in which the nation has not moved on to better standards.

The United States has made the poorest recovery record among the leading industrial nations of the world.

Restrictions Block Recovery

Recovery has not been achieved in the United States because the national administration has attempted to substitute governmental control over the economic system of the country in place of the American tradition of private initiative. It was to escape such governmental control that this country was settled and its government founded. Similar control is present and private initiative is absent in every dictator country.

The administration has demonstrated that in those activities under its direct and exclusive control, such as WPA, there is waste, inefficiency, politics and corruption. There is no evidence that these would not be present in its control over the economic system.

The physical effect of the administration's action has been to increase the costs and hazards of doing business. The psychological effect has been to create fear and destroy confidence. These effects combined have obstructed private investment, without which there cannot be the volume of economic activity necessary to sustain prosperity.

Real recovery will be forthcoming if the administration removes the obstacles it has placed in the way of private investment and demonstrates by deeds as well as words that it intends to encourage, not destroy, private initiative and intends to preserve the American system of balanced powers in government.

There is doubt that the administration will do these things. Recovery will remove the need for any except normal government spending. On continued government spending depends that political power to put into effect plans for an economy of centralized power. Therefore, "the White House clique does not want recovery."

Mr. Weir warned against war hysteria. "War, more than anything else," he said, "holds danger of actual dictatorship for America."

...ie Must Check to Half-Thousandth of an Inch

...aster craftsmen in Allis-Chalmers Mfg. Co.'s tool department checking special ...or punching segmental steel rim laminations for a 32-foot diameter rotor in a ...r-wheel generator. The die is made to accuracy of 0.0005-inch in every dimen... so that stacked laminations will match perfectly. Halves, each 15 x 48 inches, weigh about 1500 pounds

Pump-Priming Pays Only 64 Cents on the Dollar

■ Analyzing results of five years of deficit spending or pump-priming from 1934 through 1938, National Industrial Conference board finds that for every borrowed dollar spent by the federal government, at most only 64 cents was received by the people of the United States in the form of yearly real income of goods and services.

The theory of the pump-priming has been that government borrows a large amount of money, spends it, thereby increases purchasing power. It is held that this in turn will stimulate business activity, which will produce more purchasing power, which will further speed up business, which will again increase purchasing power, and so on. Eventually, according to the theory, a higher return of taxes from the greater national income will pay the expenses of pump-priming.

Actually in the five years the government increased national debt by $14,000,000,000. Instead of a vast increase in national income, however, the gain in yearly real income, eliminating the effect of price changes, was only $9,000,000,000.

"Even if all this increase can be credited to pump-priming, each bucketful of primer has produced less than two-thirds of a bucket from the well," the board states.

Editorial

Business Gains in Public Mind

■ THE ELECTION results of last November were generally interpreted as a protest against a national economic policy which was saddling a huge, constantly mounting, burden of debt on the shoulders of the nation, discouraging business enterprise, encouraging widespread unemployment and further shaking the security of the average citizen. Now, nearly six months later, those who expected the public sentiment to be translated into action which would improve our national economic condition find that very little gain had been made in this direction.

Why? The answer is to be found apparently in the psychoses that characterize human nature. It really would be too much to expect a sudden reversal on the part of those responsible for measures that were sold dramatically to the public as "reforms." That is the reason why the government's show of greater friendliness toward business so far has failed. For friendliness alone will produce no good results. But, while there is ground for disappointment over the lack of progress toward improved conditions, there are many hopeful portents of better times to come.

New Jobs Available Only as Money Is Encouraged To Enter Business

In the meantime, the features of our economic situation that need correction should continue to have widespread attention, to the end that they be understood clearly by an increasing proportion of the voters. It should be understood that under a democratic form of government the amount of employment and security depends largely on the extent to which those who have saved money can be attracted to investing it in business. That is, there is a definite ratio between capital invested and the number of jobs available. The goal, therefore, is to encourage capital to finance jobs for everybody willing and able to work.

During 1938, for example, new capital raised by American corporations through security issues totaled only $417,000,000. This was about one-fourth of the rate at which new capital flowed annually into private business during the decade from 1920 to 1930. Figuring that an average of $6000 is necessary to finance each job, that means that new employment was provided for approximately 70,000 in 1938, against 280,000 annually in 1920-1930.

Survey Brings Out Reasons Why Capital Boycotts Industry

The Bank of New York has just published an advertisement containing results of a survey of thousands of investors located all over the country. More than 75 per cent of those replying said they had money available but are unwilling to invest it in new industrial securities at the present time. Government takes too much in taxes from the individual taxpayer, said 62 per cent of those who replied. Fear of labor troubles was cited as a deterrent by 63 per cent. The possibility of new taxes on industry was mentioned by 73 per cent. Legislation restricting industry was mentioned by 77 per cent. Government takes too much in taxes from corporations, said 83 per cent.

This is the sort of information that increasingly spells horse sense to the average voter who, after observing the failure of the government's attempts to regiment security by "reform" legislation and policies, is coming to understand that there is no substitute for a good, steady job in private industry. If this lesson is learned thoroughly it will be worth the heavy price that has been paid for it over the past ten years, in that it will guarantee a more understanding attitude toward business during the present generation.

The BUSINESS TREND

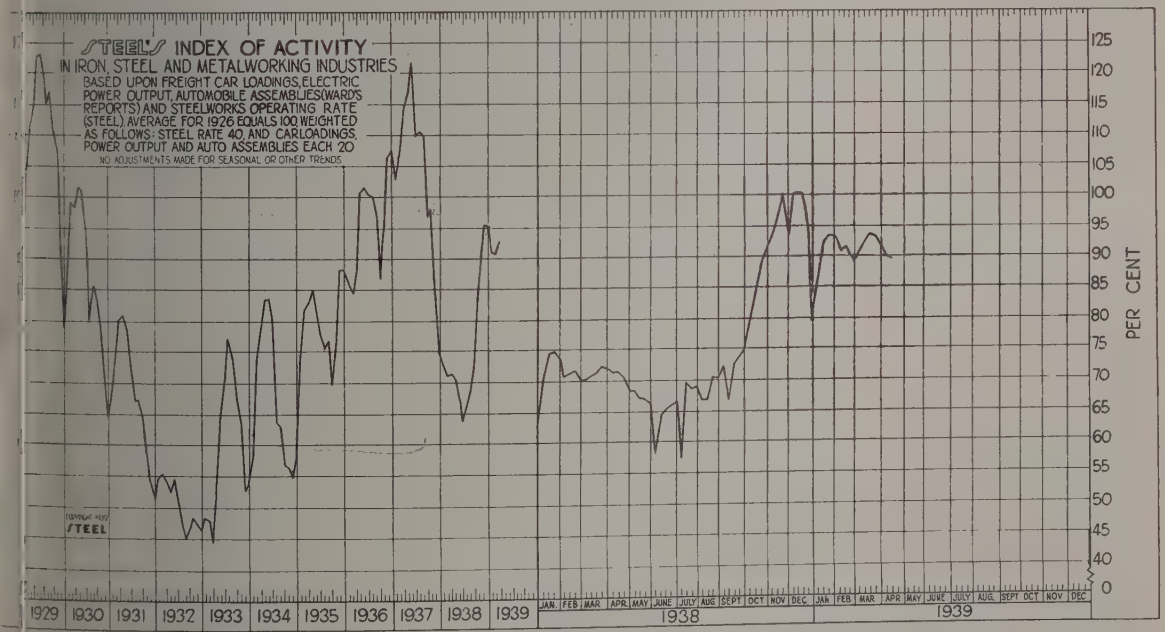
...ed Trend Force ...ex to Lower Levels

...d of industrial activity in the iron, steel and metal...ing industries continued to ease slightly in the ...nded April 15. Steel's index now stands at 89.7, a ...e of 0.3 point from the preceding week. This ...nts the fourth consecutive weekly decline, the ... sustained downward movement since the turn ... year. The present rate of activity remains sub...tly above the 71.4 registered by the index this ...ast year, although it represents a decline of 11 ... from the 1938 high of 100.7 recorded in the week ... Dec. 10.

...ributing to the recent decline in the activity index were losses in steelmaking operations and electric power consumption, which more than offset the encouraging gains in revenue freight carloadings and automobile production.

Steelworks operations eased two points to 51.5 per cent during the week ended April 15. This constitutes the fourth consecutive weekly decline from the high point this year of 56.5 per cent recorded in the weeks ended March 11 and 18. A year ago the national steel rate stood at 32 per cent, or 4 points below the spring peak of 36 per cent reported in the week ended April 2. A definite feeling of caution currently exists in the steel markets, commitments being limited to small quantities for coverage of only immediate needs.

Automobile production recorded a mild increase in the week ended April 15 to 88,050 units, compared with 87,019 in the preceding week and 62,021 in the comparable week last year. No change of consequence is indi-



STEEL'S index of activity declined 0.3-point to 89.7 per cent in the week ended April 15:

ending	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
.....	93.0	74.7	104.0	86.0	78.1	60.9	49.8	55.8	72.9	96.3	107.5
.....	92 9	73.8	99.6	86.5	79.5	62.3	50.8	56.2	72.9	97.4	109.8
.....	90.7	70.9	100.8	83.8	81.8	66.9	49.9	56.0	74.9	100.8	111.3
.....	92.1	71.2	101.9	85.9	82.7	70.7	48.7	55.5	75.4	100.9	111.7
.....	91.1	71.9	108.8	81.8	82.8	72.4	48.3	54.5	76.0	97.7	112.6
.....	89.3	70.3	112.8	83.4	80.5	75.5	46.0	55.1	75.8	99.7	109.2
.....	91.5	70.1	117.9	87.7	81.1	76.8	47.4	54.1	79.2	98.3	113.5
.....	92.7	70.8	112.7	89.7	82.0	78.6	43.4	54.8	80.6	97.5	114.8
.....	93.3	71.3	113.1	86.0	84.0	79.9	42.7	54.4	81.3	98.1	115.0
.....	93.2	72.4	114.0	91.2	84.0	79.7	44.6	53.5	80.6	99.6	115.0
.....	92.2	72.0	112.0	96.8	84.3	79.3	45.2	53.4	81.5	97.6	115.9
.....	90.0	71.3	112.8	99.6	83.4	79.6	49.1	52.6	80.9	102.3	119.9
....	89.7	71.4	119.6	103.1	85.4	82.2	52.6	53.4	81.1	103.1	121.5

cated for assembly operations during the week ended April 22. Estimates of total production throughout April have recently been revised downward to approximately 350,000 units, from the 425,000 cars formerly predicted. Retail sales have not measured up to normal seasonal expectations, although they still retain a favorable comparison with a year ago.

Revenue freight carloadings increased some 12,000 cars in the week ended April 15 to 547,816 and also exceeded the comparable week a year ago of 537,595 cars. This improvement was achieved without the aid of shipments from the closed bituminous mines in the Appalachian region.

Electric power consumption was moderately lower in the week ended April 15 at 2,170,671,000 kilowatt-hours, compared with 2,173,510,000 in the preceding week. In the same week last year power output of 1,957,573,000 kilowatt-hours was substantially below the current level.

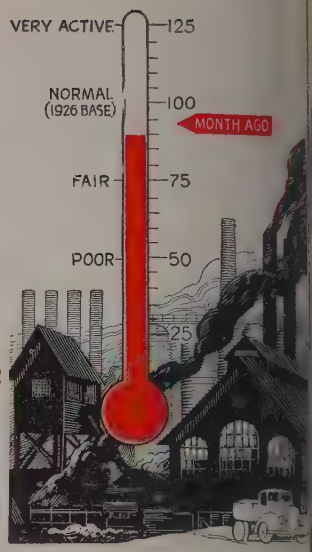
Inventories of manufacturers' stocks of finished goods continued to decline in February while those of semi-finished goods and raw materials rose slightly, according to the National Industrial Conference Board's new index of inventories. The finished goods index, which has been dropping since October, stood at 109.2 for February against 110.0 in January and 118.0 in February, 1938. The index of semifinished goods i slightly during February to 111.6 from 111.4 ary, but remains well below the 119.0 in Fe year ago.

A sharp improvement in machine tool orde domestic sources forced the National Machi Builders' association's three-month moving av dex to the highest level since October, 1937. T stands at 167.8 for March, a gain of 13.0 po February and compares with 100.4 in March a Foreign orders last month were about equa February volume. The first quarter of 1939 much better degree of participation in the placed by those companies reporting to the as than in the final quarter last year. Improveme mestic business brings with it a better distrib new orders throughout the industry.

Industrial Weather

TREND:

Downward



Where Business Stands

Monthly Averages, 1938=100

	Mar., 1939	Feb., 1939	Mar., 1938
Steel Ingot Output	137.8	136.2	82.4
Pig Iron Output	149.1	142.1	91.6
Freight Movement	104.1	100.1	96.8
Automobile Production	172.6*	141.0	107.9
Wholesale Prices	97.6*	97.8	101.4

*Preliminary.

The Barometer of Business

Industrial Indicators

	March, 1939	Feb., 1939	March, 1938
Pig iron output (daily average, tons)	77,182	73,578	47,426
Machine tool index	167.8	154.8	100.4
Foundry equipment new order index	146.6	135.3	114.6
Finished steel shipments	767,910	677,994	572,199
Ingot output (daily average, tons)	124,625	123,120	74,513
Dodge building awards in 37 states (valuation)	$300,661,000	$220,197,000	$226,918,000
Automobile output	*382,000	312,141	238,753
Coal output, tons	35,290,000	33,910,000	26,745,000
Business failures, number	1,123	963	1,088
Business failures, liabilities	$17,915,000	$12,788,000	$15,567,000
Nat'l Ind. Conf. board (25 industries) aver. weekly hrs. per worker in factory	†36.8	36.6	33.4
Factory average weekly earnings	†$26.11	$25.95	$23.53
Cement production, bbls.	.....	5,506,000	5,879,000
Cotton consumption, bales	.....	562,000	511,000
Car loadings (weekly av.)	597,603	574,347	555,735

*Preliminary.
†February, January and February, respectively.

Foreign Trade

	March, 1939	Feb., 1939	March, 1938
Exports	.....	$218,559,000	$275,711,000
Imports	.....	$158,035,000	$173,405,000
Gold exports	.....	$15,000	$20,000
Gold imports	.....	$233,296,000	$52,947,000

Financial Indicators

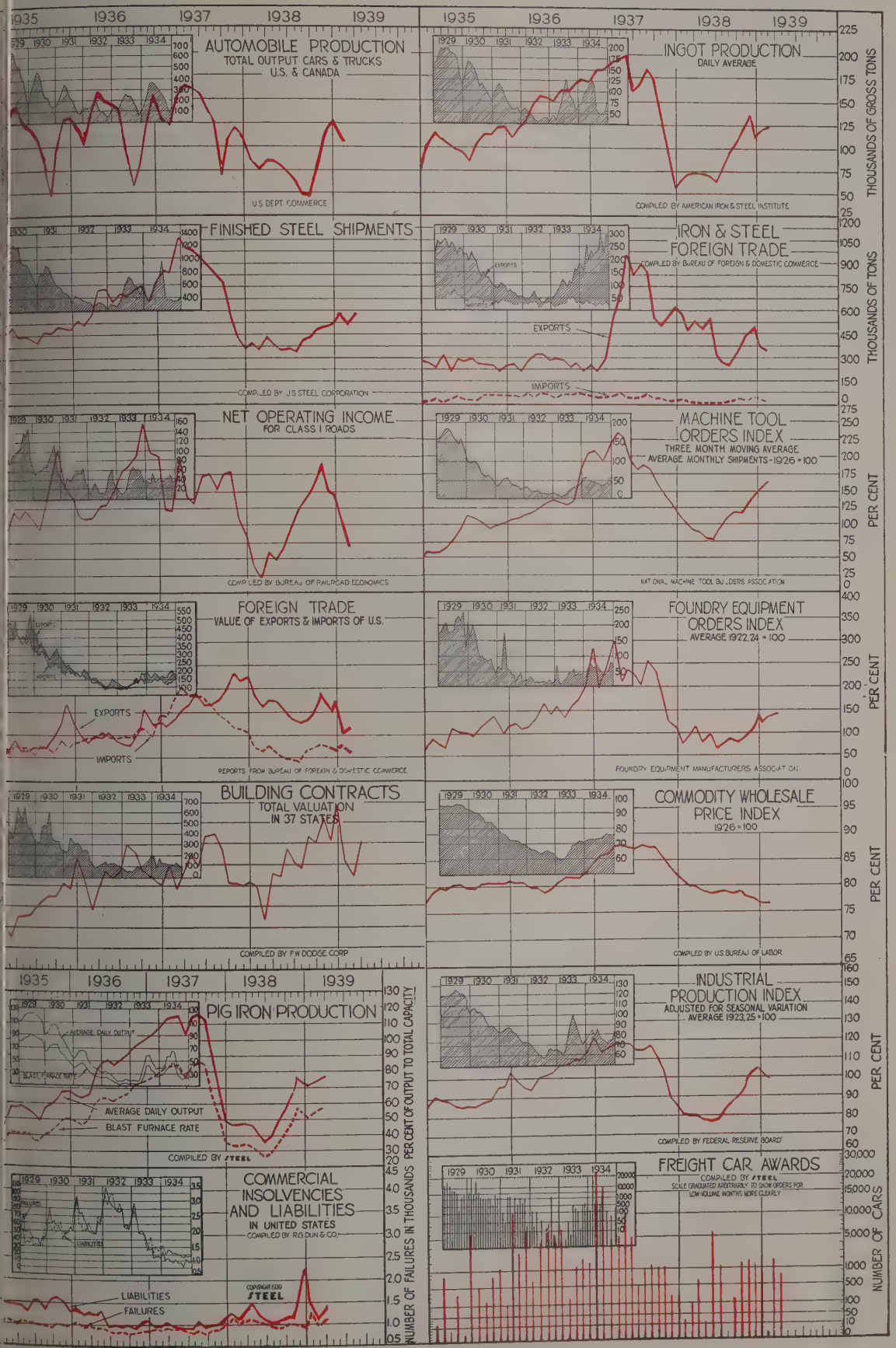
	March, 1939	Feb., 1939	M
25 Industrial stocks	$178.01	$181.21	
25 Rail stocks	$23.18	$23.24	
40 Bonds	$72.72	$72.56	
Bank clear'gs (000 omitted)	.....	$19,711,000	
Commercial paper rate, New York (per cent)	½–⅝	½–⅝	
*Com'l loans (000 omitted)	$8,191,000	$8,186,000	
Federal Reserve ratio (per cent)	84.7	84.2	
Capital flotations:			
New capital	$162,258,000	$377,550,000	$1
Refunding	$77,658,000	$163,173,000	$1
Federal gross debt (millions of dollars)	$39,985	$39,859	
Railroad earnings†	.....	$32,890,771	‡
Stock sales, New York stock exchange	24,565,054	13,876,813	
Bond sales, par value	$185,855,800	$119,402,725	$1

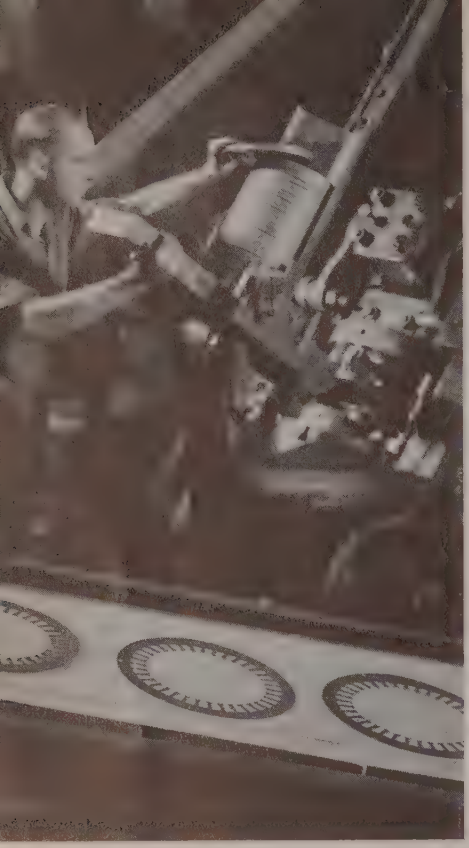
*Leading member banks Federal Reserve System.
†February, January and February, respectively.
‡Deficit.

Commodity Prices

	March, 1939	Feb., 1939	M
STEEL'S composite average of 25 iron and steel prices	$36.40	$36.37	
U. S. Bureau of Labor's index	*76.7	76.9	
Wheat, cash (bushel)	$0.87	$0.87	
Corn, cash (bushel)	$0.63	$0.64	

*Preliminary.


1935 1936 1937 1938 1939
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS
U.S. & CANADA
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
THOUSANDS OF GROSS TONS
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
THOUSANDS OF TONS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
EXPORTS
IMPORTS
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION
IN 37 STATES
COMPILED BY F.W. DODGE CORP
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
PER CENT OF OUTPUT TO TOTAL CAPACITY
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
NUMBER OF FAILURES IN THOUSANDS
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS



Mass production of stamped laminations in connection with the manufacture of Westinghouse motors at East Pittsburgh

CAN *Pride* BE INSPI

By GUY HUBBARD
Machine Tool Editor

■ A COMMON indictment of mass production is that it completely fails to inspire in the rank and file of those engaged in it, the slightest degree of pride in workmanship or any real interest in their work. Anyone who has had much to do with mass production knows that as a matter of fact a great many of the so-called routine workers actually do have real pride in their work and interest in it beyond the time clock and the pay envelope. Let any open minded investigator delve into this and he will find this true all the way from watch factories to automobile plants. It is one of the reasons why American industry turns out good products.

However, as James A. Weaver, president of the American Society of Tool Engineers, suggested in March 27 STEEL, it is desirable that efforts should be made to transmit a greater amount of the skill and craftsmanship of tool and machine creators to tool and machine users in production plants, if industrial relations as well as products are to continue to improve.

This matter is being given a great deal of serious and constructive thought—not only by men like Mr. Weaver who are concerned with the selection of manufacturing equipment, but also by the builders of such equipment and by the personnel management and the higher executives of machinery using industries.

Smart executives know that it is good business to maintain a clean, comfortable, well lighted and well equipped shop. They know that it is not possible for a good workman to do a good job with poor tools—and like it. No one today expects to be able to obtain the services of a competent laundress in a laundry equipped with a cistern and pitcher pump; a wood stove and wash boiler; wooden wash tubs and a zinc washboard. Then why expect good workmen in a shop to put up with metalworking equipment of a similar era when they know and appreciate the convenience and other advantages of modern equipment?

Plant Influences Men

One sure way to have a working force which is interested in turning out good work, is to maintain a plant which will attract that class of workmen. Experienced men who get work in that kind of a plant are anxious to hold their jobs therein. Beginners who are fortunate enough to get started under such conditions are most likely to develop into the right kind of workmen.

The psychological effect of plant on workmen has been appreciated by experienced shopmen for a great many years. Old-time Brown & Sharpe workmen often mentioned an interesting case in point which occurred during the construction of a shop building nearly 70 years ago. As was common in shops of that day, the brickwork was exposed on the inside as well as on the outside.

One day Frederick W. Howe, one of the officials of the company noticed that one of the walls was to be one of the manufacturing departments ing unevenly laid and c pointed up. Mr. Howe insis the wall be torn down, a and pointed with meticulou ness. He said: "If the wor the benches in this departm a careless piece of work befo all day long, they will grow themselves. If they have piece of work in front of th own work will be good."

Psychological Experim

Wendell E. Whipp, pres the Monarch Machine Tool long ago tried an interest chological experiment in h the-minute machine tool Sidney, O. He had attache machines in his plant plate carried—in addition to th information as to make, m —the cost of the machines w chased.

The effect of this figure value of the machine was be rather surprising and gratifying as far as the oper concerned. It was obvious cases that the operator's r was something like this: run a good many lathes, is the first time that I ha lathe which I knew cost didn't realize before that tools cost as much as they all, it's quite a responsibili entrusted with such an e piece of equipment. The ment must have faith in m parently it's up to me to ta care of this machine and get I can out of it."

The desirable effect o plates became so obvious, that customers who went the Monarch plant began notice of them and request to come in that new lathes livered to these customers be equipped with similar tion plates." This is a ve

craftsmanship

MACHINE OPERATORS?

of management taking men
onfidence—which seems to
f the trends of the times.
seems to be a growing feel-
e part of management that
derstanding on the part of
l of the problems facing
nent is conducive of better
r-employe relations. To that
ers are being used in some
nformation slips in pay en-
in others, house organs in
ses and forum-type meetings
es are made use of.

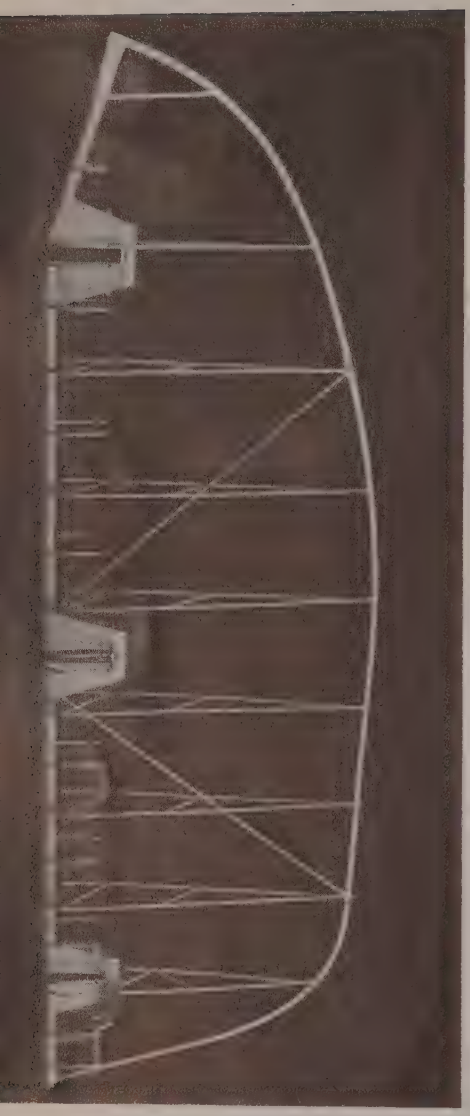
not similar tactics be fol-
a large plant in making
conscious of the importance
particular production or as-
operations in the big task
g out the best possible prod-
s a matter of fact I recall
ne years ago the manager
duction plant of quite con-
e size told me that whenever a new man was hired—no matter in how obscure a position—he was taken on a tour of the entire plant before being installed on his particular job.

Then when he was put to work care was taken to impress him with just how his work fitted in with the general scheme of things and how vitally important his job was toward the general success of the company. He might be making nothing more than a simple pin or shaft, but knowing where that shaft entered into the product and what it did, gave him a very real sense of being a definite part of the organization. According to my informant, this program generated a definite spirit of craftsmanship throughout the plant which more than repaid the small amount of trouble and expense involved.

Seeking definite information as to the reaction of workers toward the latest machine tools, I recently questioned one of the Cincinnati machine tool builders as to his experiences in Russia. "You might expect," he said, "that the simplest kind of equipment would be purchased by the Russians—in view of the labor conditions there. That, however, by no means is the case. They demand from us not only our very latest models, but these latest models in their most complete form as far as attachments and tooling are concerned. According to their buyers, experience in Russia has shown that the better the manufacturing equipment, the faster the

(*Please turn to Page* 69)

Toolmakers assembling and adjusting intricate rotor and stator dies in the tool and die department of the Westinghouse plant at Lima, O.



Steel

In Airc

Although aluminum alloys account for 80 per cent of structural weight of present air the author points out that steel tubing sh presently assume a more important positi this field due to its many inherent advantag detailed here. Need for much researc emphasized

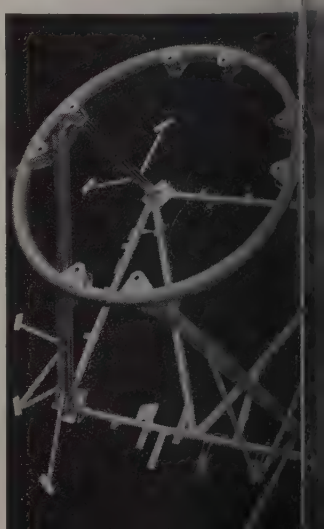
■ THE NEW structural research laboratory now planned by the National Advisory Committee for Aeronautics to be located at Sunnyvale, Calif., calls attention to the need for more and better knowledge about materials suitable for airplane structures and parts.

When the so-called monocoque design first entered the picture 10 or 12 years ago, aluminum alloys appeared most suitable. Alum loys now account for appro 80 to 85 per cent of the st weight of most aircraft use tional defense and large tr

This is a dangerous situ this material, in a nation gency, might not be availab ficient quantities to meet pr requirements. At least two materials should be availa

It is important that such

Above at left, rudder structure ed steel tubing—for a Bellanc 28-9OB. Left, typical landing sembly made of steel tubing an engine mount assembly o steel tubing. Note ease with w fittings can be fastened to th work



Tubing

struction

By J. P. DODS
Summerill Tubing Co.
Bridgeport, Pa.

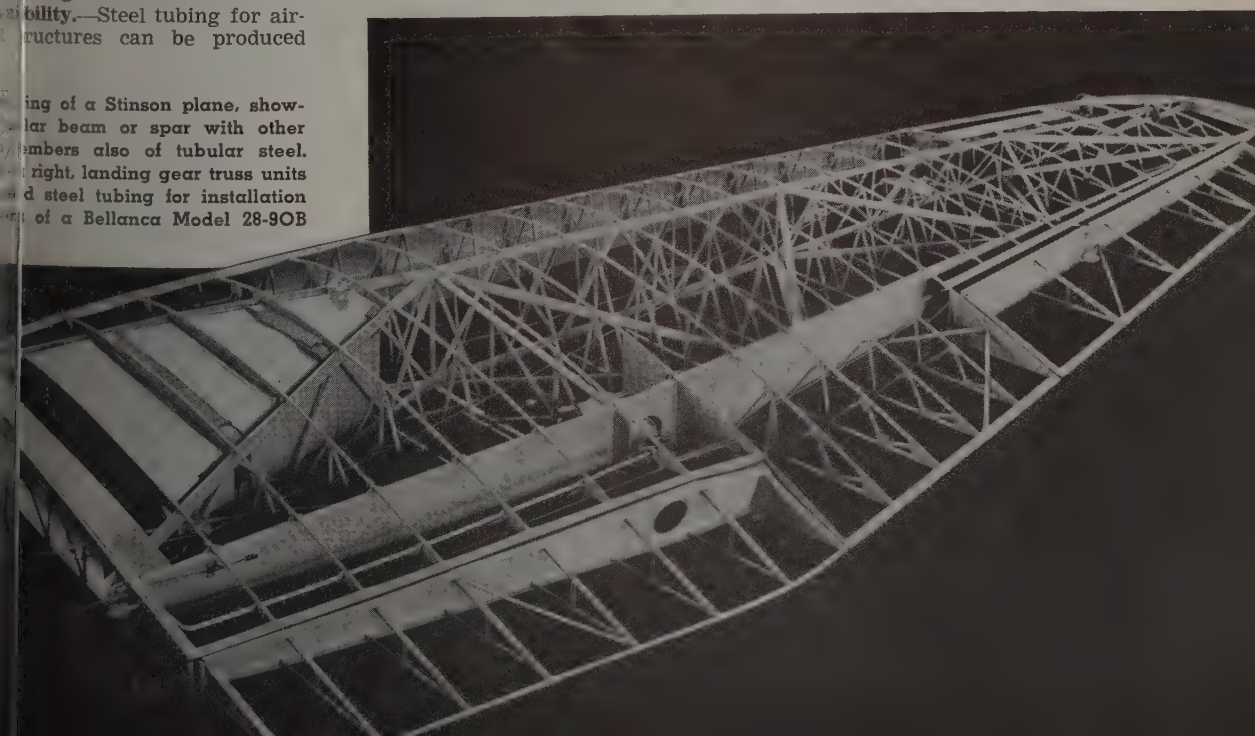
uirements detailed below:
material must lend itself
modern advancing designs.
must be readily available in
nd forms suitable for air-
uctures.
must be adaptable to large
duction methods.
material must justify it-
omically; that is, first costs,
on costs and upkeep ex-
ust be reasonable.

ubing is worthy of consid-
for aircraft structural ma-
yond its present use in mod-
gn of aircraft for national
This statement is based on
wing factors:

bility.—Steel tubing for air-
uctures can be produced quickly and in large and continued volume to meet the demands which would be imposed upon the industry by a national emergency. It is produced in widely separated areas — from eastern seaboard to states in the Middle West.

The alloying elements required for known grades of steel now being used are readily obtainable. Production facilities are owned and controlled by competitive interests. The chances for complete tie-up or serious delay in tubing production are extremely small.

It is generally accepted that the potential capacity of the steel indus-



ing of a Stinson plane, show-
lar beam or spar with other
embers also of tubular steel.
right, landing gear truss units
d steel tubing for installation
of a Bellanca Model 28-90B

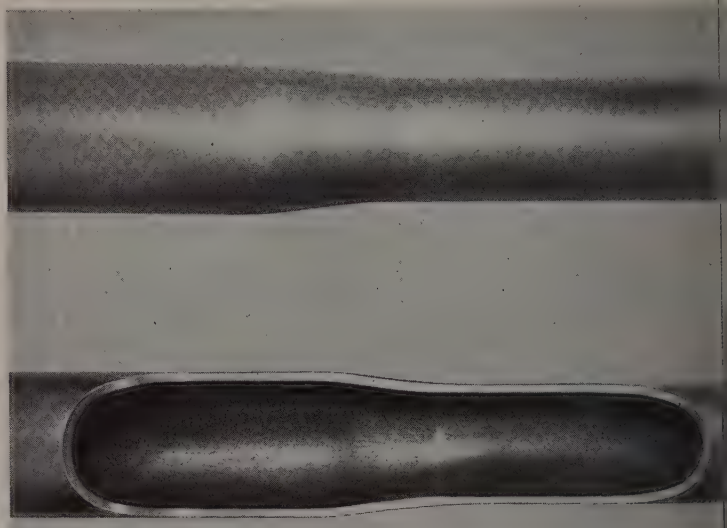
try has never yet been utilized in this country. In making these statements with reference to steel tubing, we have taken into account not only the equipment for basic steel production but also piercing, hot rolling and cold finishing facilities.

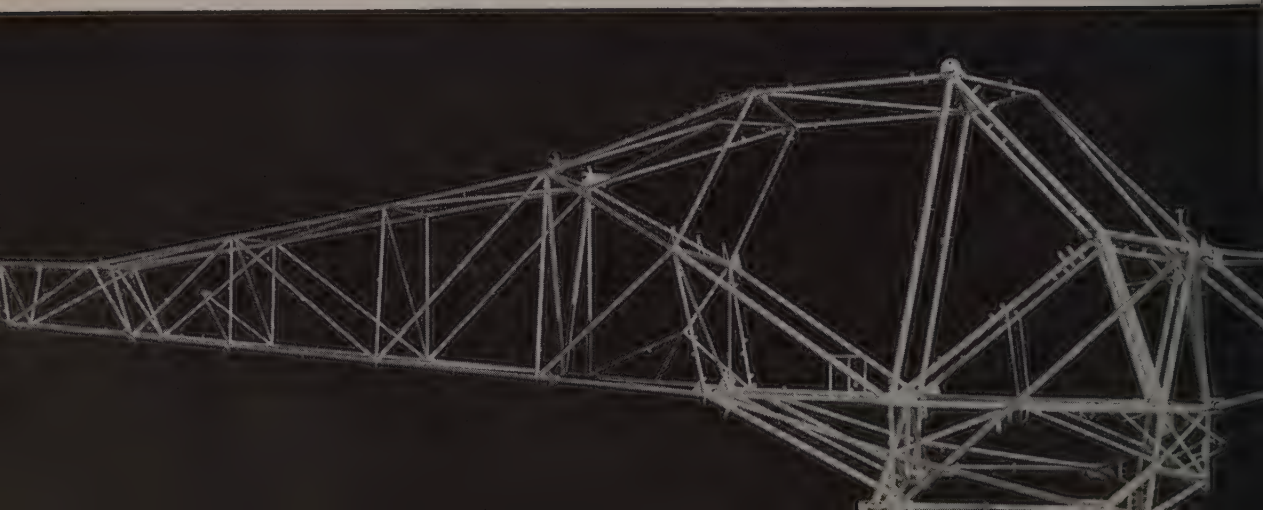
Physical Values.—Steel tubing is now the accepted material for many of the most critical parts on aircraft, such as engine mounts, landing gear, etc. Many complete designs are being manufactured by private industry from steel tubing utilizing values and production methods which, while they can still be improved, are not being fully utilized for nat fense planes.

Almost no research of b the industry as a whole carried on with steel tubi years. In this period, the steel has materially impr due to lack of new designs steel, advantage is not bei of the present physical p and quality of material. are lower physical properti used in design, but the a permitted are generally bas formation which we believ of date.

Steel tubing is available fr ent grades of metal such mium molybdenum, SAE grade, now commonly use range covers annealed most suitable for cold form malized material with a t tensile strength of 100,000 per square inch and 130,00 per square inch if requir treated tubing up to 180,00

Left, closeup of welded tubular steel framework forming part of fuselage. Note tapered member here. Below, cross section and outer view of tapered steel tube. These members afford valuable weight savings through better distribution of weight-strength ratio. Extreme lower view shows tubular steel fuselage with detachable and vibration-absorbing engine mount at right





re inch with 6 per cent elon-

ed Tubes.—Although a few cturers have utilized tapered or aircraft structures, the their use has hardly been d. Tapered tubes offer a saving in weight through a distribution of the weight- ratio. New equipment will able this year for producing tubes in about any combina- iameter and wall likely to be

one exception, no aircraft onal defense has been built tapered tubes.

cally all fabrication of steel structures has been done by ylene welding. While valu- to the short time required ning welders, low cost of jigs, l tools, and excellent struc- oduced, almost no work has ne in recent years to improve structures by heat treatment elding. The opportunity for in this field is tremendous. ermore, its advantages are ndicated by research already Europe preceding design and on in Germany, Italy and and accompanying the use of steel. Some of these s are utilizing four different welding: Oxyacetylene, arc, ce and atomic hydrogen The second prize awarded James F. Lincoln Arc Weld- ndation was awarded to an Italian for his work on welding aircraft structures.

Steel tubing of the proper temper can be formed readily. It can easily be bent, swaged and expanded to make it more suitable for certain structural parts. It is available in tapered sections to meet strict weight-strength ratio requirements and to reduce weight of structures.

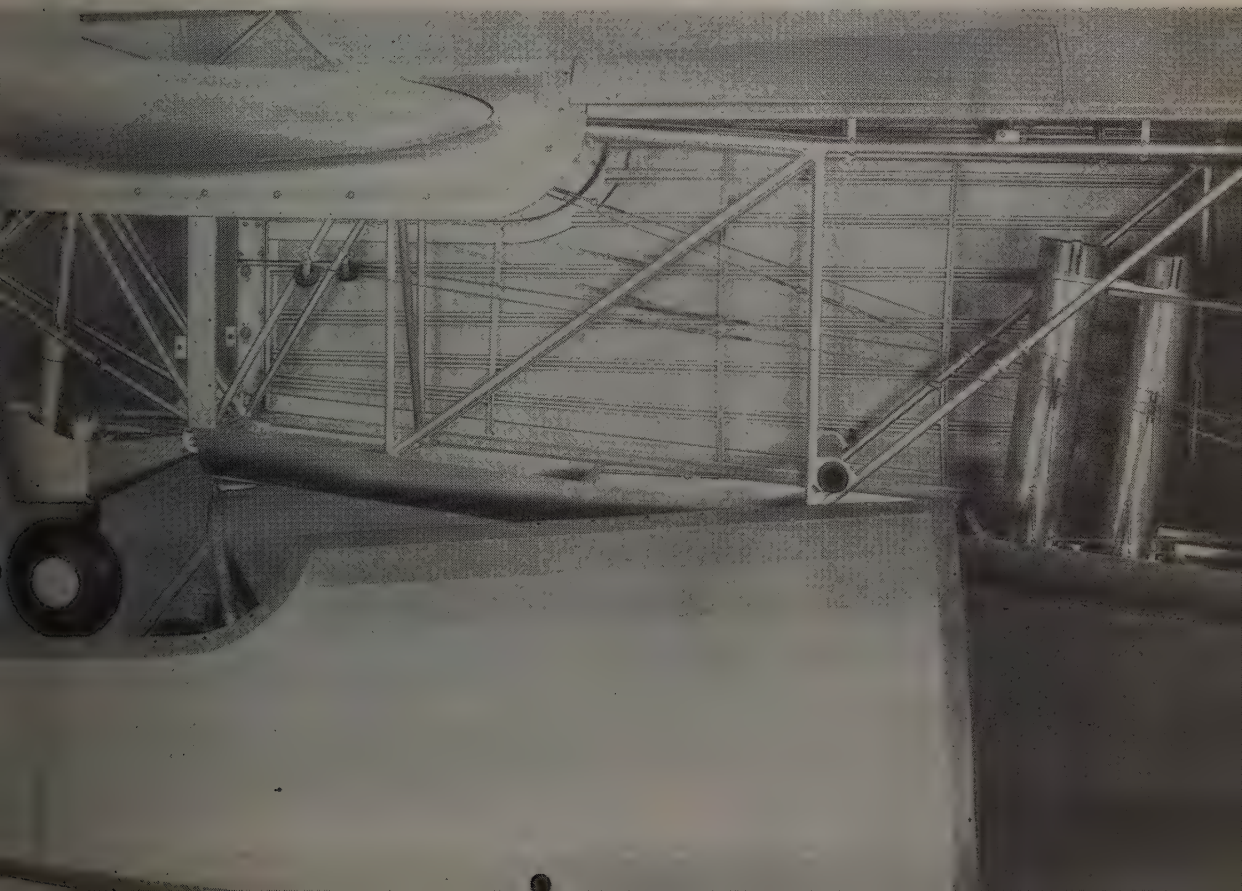
Accessibility.—It is generally recognized that tubular structures are more accessible during fabrication than structures made of other materials now in use. This accessibility permits more men to work both inside and outside. Generally speaking this means faster work and therefore less costly production.

Designs now under way indicate air speeds of 350 and 400 miles an hour. It has been stated that in all probability this will mean the moving of power plants into the structures, completely enclosing engines in wings or fuselage. Under such conditions, accessibility for installation, inspection, repair and during operation is most essential. Steel tubing already has proved its fitness for such structures and further improvements can be made with proper research and development.

Repairs and Maintenance. — Past

(*Please turn to Page* 55)

Right, retractible landing gear of tubular steel construction. Below, side panel removed to show tubular steel structural members and landing gear



Heating Rounds for Pie

New type of furnace uses walking beam mech ism adapted to heating of rounds, produce more uniformly heated product, reduces f costs, cuts working time. Chromium coveri gives mechanism the necessary heat resista to withstand the high temperatures

By G. R. McDERMOTT
Surface Combustion Corp.
Toledo, O.

■ PIERCING round billets or ingots to produce seamless tubes and pipe requires that the steel be uniformily heated from end to end and also from the center outward. Uniformly heated steel is most essential to get uniform wall thickness in piercing operations. Furthermore, the furnace should deliver steel with scale of such a type that it readily falls off and results in minimum abrasion if carried into the mill.

Conventional furnaces for this service have solid, sloping hearths. The round billets or ingots to be heated usually are charged in the high end of the furnace from the charge table and are rolled down the hearth by means of long heavy bars introduced through doors arranged along both sides of the furnace.

This procedure necessitates frequent opening of the side doors, resulting in considerable air infiltration further aggravated by the internal stack effect within the furnace caused by the sloping hearth.

Furthermore, although the billets roll on the hearth, they are not as uniformily heated as if they were heated by burners located above and underneath the steel.

Youngstown Sheet & Tube Co., when contemplating installation of a new piercing mill at its Campbell works, desired a billet heating furnace design which would produce more uniformly heated work and which would eliminate un heat losses. After conside ferent designs, it was finall to use a walking beam m to advance the steel thr furnace for a major porti heating before dischargin soaking hearth to insure heating. Walking beam m have been used extensively face Combustion for such a in sheet normalizing as wel and pair furnaces for the s tin plate industry, but not a large scale and at the h high temperatures encoun this installation.

Fig. 1—Here a heated round discharged from the heating

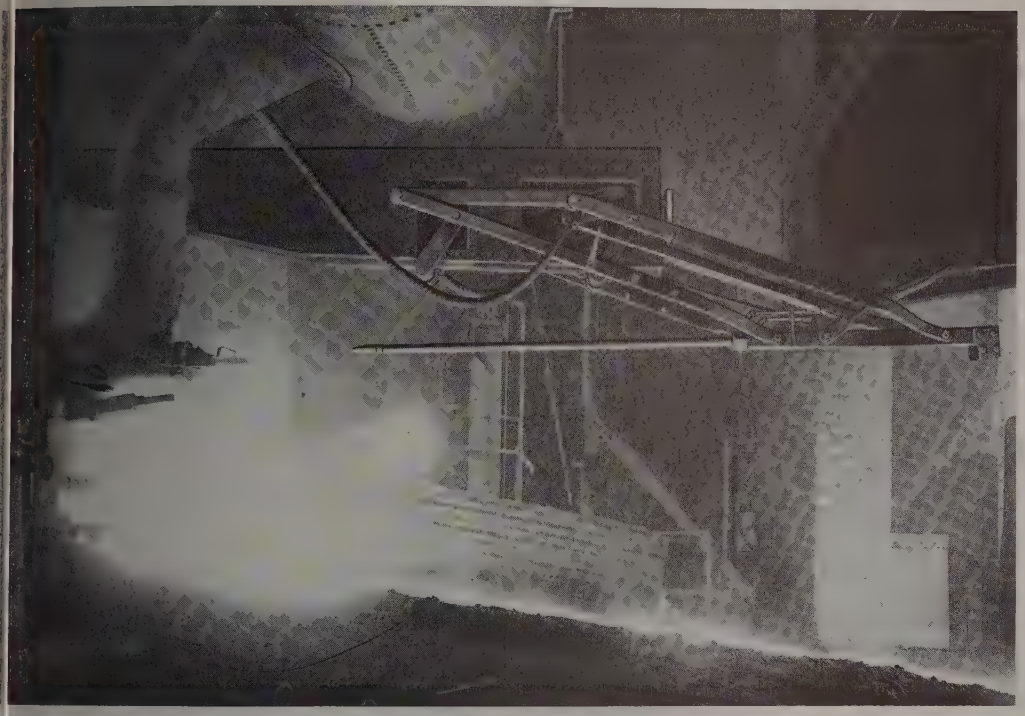
Triple-firing

Figs. 2 and 3 show the design as built and in o Two of these units are use is about 86 feet long and wide, designed to handle 50 hour when heating two round billets ranging fro 10 inches in diameter and feet long. Each is triple-f is similar to Surface Cor furnaces used to heat slabs tinuous hot strip mills. ducer gas is burned in the heating and soaking zone natural gas is used in the under-firing zone. The unc burners insure thorough he the billets and afford suffici input for large tonnage ments.

Application of automatic tion control to all zones is especially since main heat soaking zones are fired with producer gas. In additio matic temperature control vided for the soaking zon

EGUARD YOUR EMPLOYEES AT THE

Cinder Notch



THE AMERICAN SAFETY CINDER NOTCH STOPPER
(Patented)

This Cinder Notch Stopper is designed to meet the most exacting conditions at the Blast Furnace Cinder Notch.

The equipment is ruggedly constructed to withstand the most severe service, is easily operated without the necessity of any workman approaching the danger zone.

It provides absolute safety for your men and reduces your costs by eliminating all accidents at the Cinder Notch.

guarantee its op-
on will satisfy the
critical blast fur-
nace operator.

Eliminate Accidents at the Cinder Notch. Your workmen will appreciate your thoughtfulness.

WILLIAM M. BAILEY COMPANY

PITTSBURGH — ENGINEERS — PENNA., U.S.A.

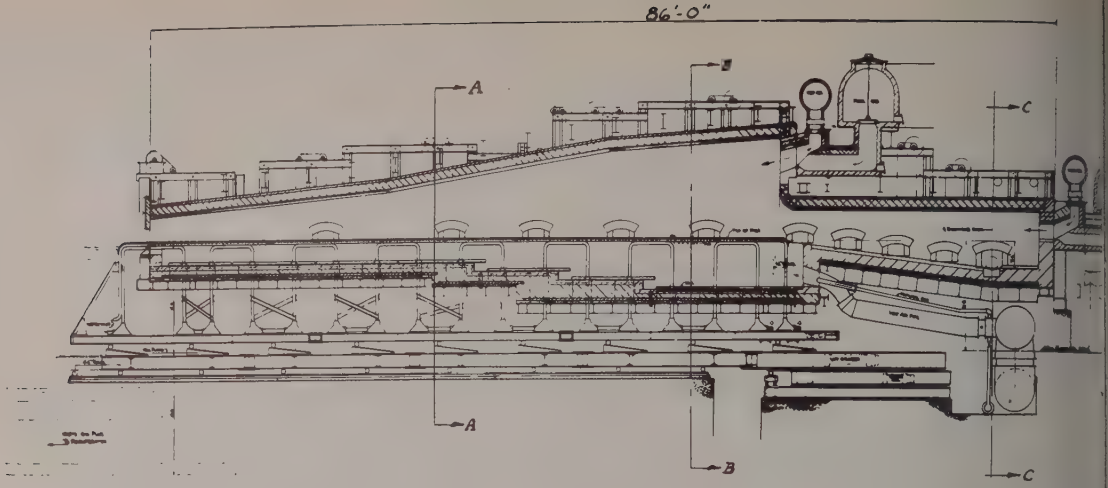


Fig. 2—New furnace with walking beam conveyor to carry work through the furnace to the soaking zone

also is a novel feature and is accomplished by a radiation pyrometer installed in the roof of the zone and operating a double-decked mushroom valve in the producer gas main. This arrangement controls the zone temperature within 25 degrees Fahr.

Walking beam mechanism consists of two units per furnace, one on each side of the longitudinal centerline of the furnace so two rows of billets can be advanced through the furnace to the inclined solid hearth of the soaking zone. The walking beam units are operated together or separately, depending on the length of the billets. These units are constructed of double, extra heavy, seamless steel tubing, water cooled in a continuous circuit.

All surfaces exposed to furnace temperature are covered with plastic chrome patch, securely anchored to the tubing. This covering not only reduces heat loss to a minimum but also presents a radiant surface to the steel being heated. Any shadow from the walking beam mechanism is superficial and quickly disappears at the beginning of the soaking hearth.

Maximum horizontal stroke of the walking beam is 14 inches, although length of stroke may be varied to suit the desired tonnage or number of billets required per hour for the mill. Cycle of operation is under push button control of heater, although automatic recycling may be obtained.

Hydraulic Power

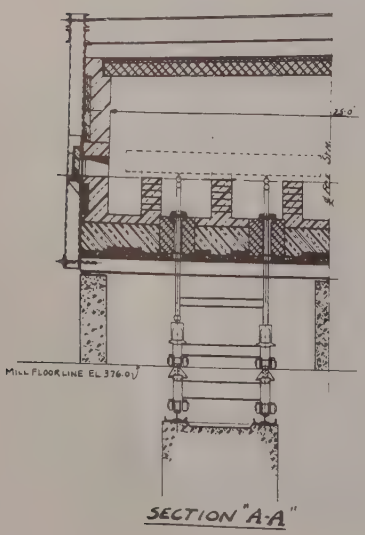
Hydraulic power drives the mechanism by means of cylinders located at forward end of furnace underneath the soaking hearth. One cylinder raises the entire load of steel from the stationary refractory piers located between each walking beam, using horizontal wedges and rollers which form part of the upper longitudinal carriage beams. Other hydraulic cylinder is below the lifting cylinder. It moves the entire superimposed load as well as the entire walking beam mecha horizontal direction.

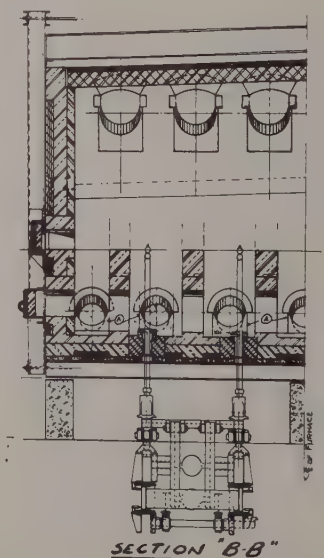
Operating medium is pounds maximum pressur this figure will vary, de the superimposed load o ing beams. This, in turn tion of the length and d the rounds being heate pumps and solenoid valves the hydraulic equipment valves control the oil flo cylinder in proper seque tain the desired walking erating cycle. A 25-horse stant-speed motor drives which supplies the hydra required for each furna heating 10-inch rounds. imposed load amounts t tons on each side or on ing beam.

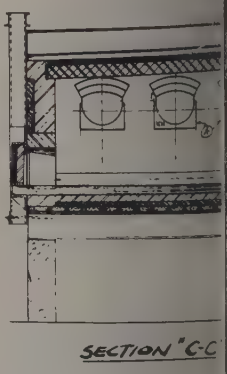
When the walking bear use, top beams of the mec below the top of the piers upon which the ro

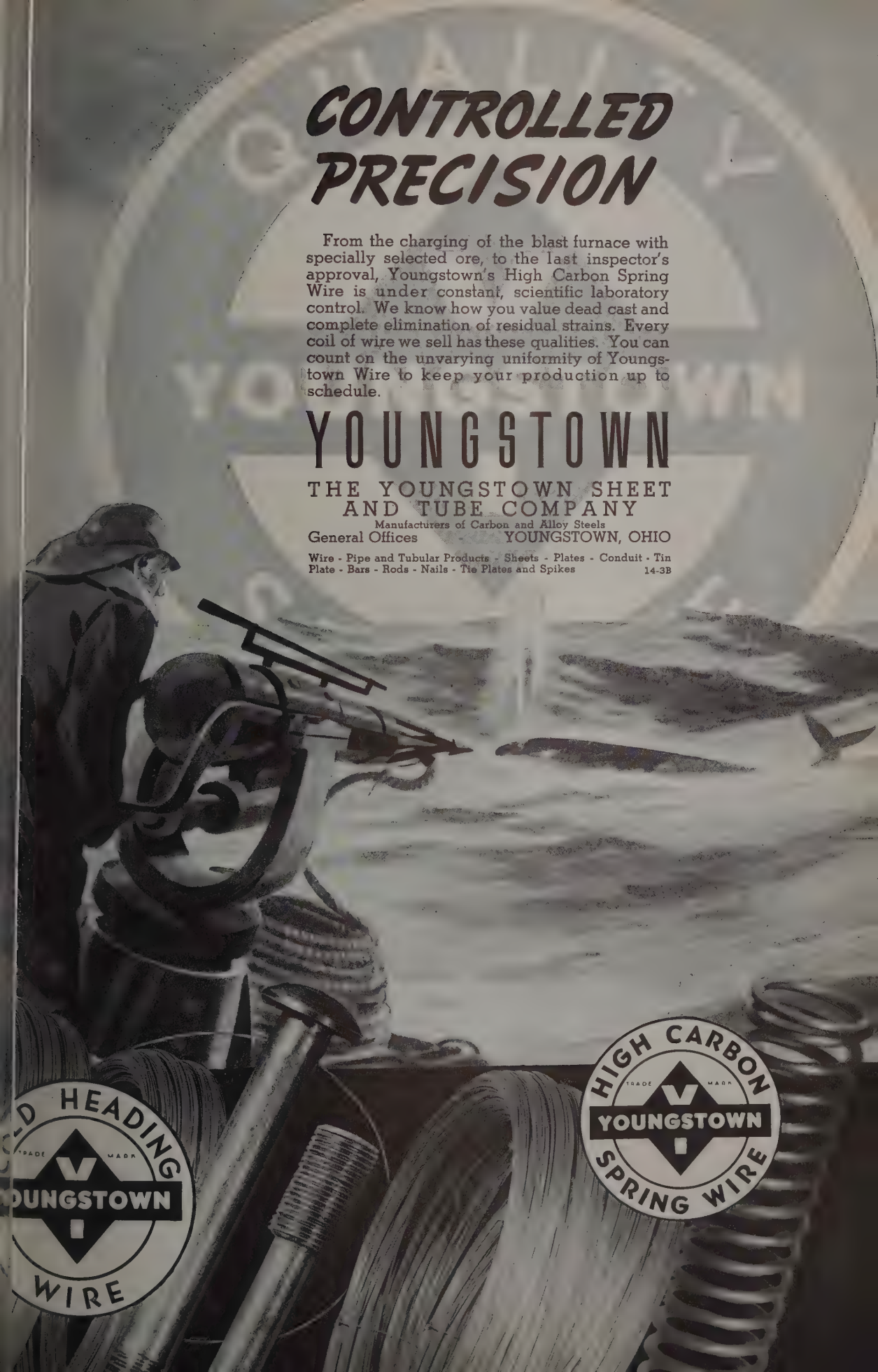
(Concluded on Pag

Fig. 3—Cross sections throu at points marked in








CONTROLLED
PRECISION
From the charging of the blast furnace with specially selected ore, to the last inspector's approval, Youngstown's High Carbon Spring Wire is under constant, scientific laboratory control. We know how you value dead cast and complete elimination of residual strains. Every coil of wire we sell has these qualities. You can count on the unvarying uniformity of Youngstown Wire to keep your production up to schedule.
YOUNGSTOWN
THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices - YOUNGSTOWN, OHIO
Wire - Pipe and Tubular Products - Sheets - Plates - Conduit - Tin Plate - Bars - Rods - Nails - Tie Plates and Spikes
14-3B
HIGH CARBON
TRADE MARK
YOUNGSTOWN
SPRING WIRE
HEADING
TRADE MARK
YOUNGSTOWN
WIRE

Liquid Life Savers

New coatings of nonmetallic materials offer effective protection against corrosion during shipment and storage. Include nondrying or "slushing" type; a hard drying, transparent coating; those with aluminum pigments and some special types

By D. L. WRIGHT
and
H. D. KOLB
Penola Incorporated
Pittsburgh

■ MANY methods have been used for decades to combate loss through rusting. The most important, most widely used perhaps, is the application of protective coatings. These coatings may be either of two main types. They may themselves be rust resisting metals, or they may be derived from nonmetallic materials. Coatings of the latter type are the more widely used.

Realizing the acute need for improved nondrying or slushing types of protective coatings, a research program started over two years ago had as its primary objective the development of an inhibitor which would enhance the corrosion resistant properties of any product to which it be added for protection.

The first stage in the research program was the study and evaluation of existing rust-preventing products and the development of many experimental materials. All were given intensive laboratory tests. Even the testing methods had to be adapted or developed. For example, in the humidifier test, instead of using static humi as was the general custom action was accelerated by controlled air flow thr humidifier. In this way, r test pieces was speeded up hours or days from the months necessary with sta

After the extensive l development and testing tests were conducted in a different metal working Final result was develop wide variety of rust p coatings, now marketed u name, Rust-Ban.

Four General Type

The products are of four types: Non-drying or "s hard-drying transparent aluminum coatings and mi ous coatings. Often called compounds, the non-drying range in consistency from v to solid. All contain a rust which, together with other ents, gives complete p against corrosion. In additio coatings do not harden, cra or slip from metal surfa though they all are easily re with a petroleum solvent. applied by spraying, dippin bing or other less conv methods. Designed for use i variety of applications, thes ucts are classified by type solvent, (b) fluid, (c) semi-fl (d) solid.

(a) Solvent Type, Non-dryi ing. Solvent type, non-dryi tective coating, known as R 333, is for indoor use only.

Applying solvent type Rust-Ban means of a machine. This will products against corrosion duri age or further processing. Phot tesy "Esso Oilways"

"CLEANER, BRIGHTER WORK WITH ORTHOSIL," TRADE MARK

SAY KNAPP-MONARCH, "REJECTS REDUCED"

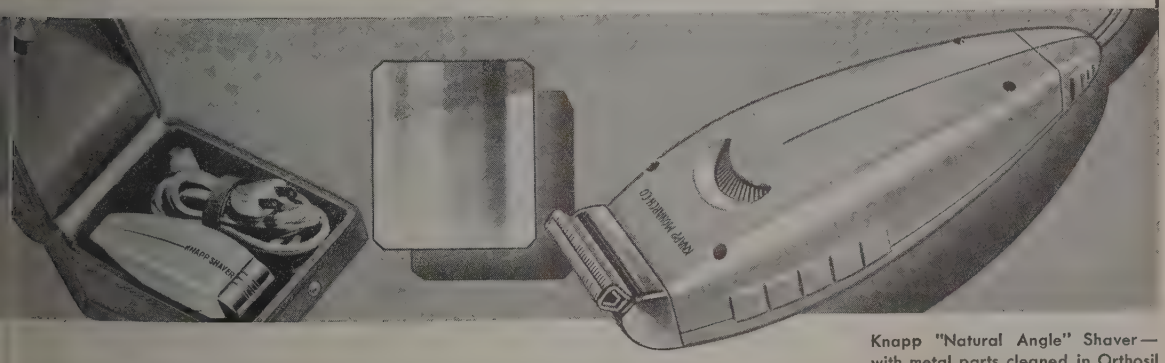
The Knapp "Natural Angle" Shaver is the newest of the many household electrical appliances made by this well-known firm. Here is a field in which fine appearance and permanence of finish are vitally important. And the metal cleaning prior to finishing operations goes far to control the results.

After thorough tests, Knapp-Monarch selected Orthosil for electrolytic cleaning of electric household appliances. Results? A much brighter and cleaner appearance of the finished pieces. Rejects reduced. 150,000 pieces run through the solution before it is dumped! The usual copper strike is eliminated.

Orthosil is a heavy duty metal cleaner for use with ferrous metals and brass . . . outstanding in its quick action because it does not contain weak ingredients and is free of water. Especially effective in electrolytic cleaning because of its high conductivity. Cuts through oil and grease coatings, laying bare the clean metal for pickling and final finishes. Prevents grease and dirt from re-depositing. Dry, highly concentrated, economical.

Orthosil gets real results for Knapp-Monarch . . . why not let it go to work for you?

PENNSYLVANIA SALT MANUFACTURING CO.
Est. 1850 • Widener Bldg., Philadelphia, Pa. • New York
Chicago • St. Louis • Pittsburgh • Tacoma • Wyandotte



Knapp "Natural Angle" Shaver—
with metal parts cleaned in Orthosil

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals

tains a high percentage of volatile ingredient which after application evaporates to leave a thin but highly effective, almost invisible coating. It is applicable to strip steel, castings and to almost any machine parts subjected either to high humidity or to acid fumes.

(b) Fluid Type Non-Drying Coatings. There are three fluid type coatings: Rust-Ban 336, 337 and 339. Rust-Ban 337 and Rust-Ban 339 differ from each other in viscosity; both contain lubricating oil bases and no volatile constituents and provide an oily film which gives better resistance to humid atmospheres. Recommended for the same general applications as Rust-Ban 333, they likewise are not suited for prolonged outdoor storage conditions. Rust-Ban 336 is a special material designed solely for priming corroded metal surfaces prior to the application of Rust-Ban 327.

Weather-proofing

(c) Semi-Fluid Type Non-Drying Coatings. These are known as Rust-Ban 343 and Rust-Ban 347, and the latter should preferably be heated before it is applied by dip, brush, or swab. Both 343 and 347 are for use on machine parts, bar steel, and other metals, either indoors or outdoors, particularly where excellent resistance to rain, sunlight, salt spray, and high humidity are desired.

(d) Solid Type, Non-Drying Coatings. Known as Rust-Ban 324 and 327, the solid type coatings are intended for outside use where the action of corrosive influences creates a need for a comparatively permanent, semi-hard coating. Although its surface may be fairly solid, that part of the coating next to the metal remains soft and plastic. All solid type coatings seal pores and, because the film expands and contracts with changing temperatures, eliminate cracking.

Corrosive Conditions

Rust-Ban 324 is suitable either for indoor or outdoor use and is particularly desirable for protection of all types of equipment where high resistance to corrosive conditions is needed. It should preferably be applied after warming to a fluid consistency.

Rust-Ban 327 is the heaviest bodied product, and applied after heating it produces a semi-hard coating extremely useful for protecting underground and underwater pipes. It also is applicable where severe corrosive agents are present and is employed to protect bridge cables, couplings, and steel structures.

Hard-Drying Transparent Coatings. Varnish-like and transparent, these are applied like paint and dry to a hard ductile film. They are improvements of products developed some years ago and formerly sold under the name Penlaco. These coatings are of two sorts depending on the characteristics of the volatile ingredients — safety-solvent types, Rust-Ban 214, 216, 220 and 222, and quick-drying types 225 and 229. The safety-solvent types contain a volatile portion with flash points above 100 degrees Fahr., and differ from each other only in fluidity; the lightest and 222 heavi quick drying types have constituents flashing bel temperature and are des use where spray applica quick drying are necessar

All hard drying types Ban products are applica nonremovable, durable coatings are needed. They use where protection agai sion is desired during a period or during shipment such as pipes, bridge sec chine parts, castings, bar s rails, tools, wheels, and Being transparent, they ready visibility of any surf ings like serial numbers imperfections in the met also, the film does not either with subsequent operations or with painting

Of low cost and great pe these hard-drying rust pr are highly resistant to both fresh water. They will nei nor peel, and have sufficien ty so that expansion and co of the metal have little effe film. They also have great r to deterioration from sun from mildly corrosive li fumes.

Aluminum Coating

Rust-Ban Aluminum Co aluminum powder or pas vehicle—are available special 2-compartment c holding the pigment and separate for mixing on the Ban 294 uses powdered Rust-Ban 295, paste pigm vehicle is a special oil varn with which are combined dr and various varnish gums with a volatile solvent and ing with the most rigid speci for this type product.

Special types of rust pr products are now being ma able for specific uses wh products previously descri not entirely applicable. Amo special products is Rust-Ba black varnish-like liquid wh tains an exceptionally pure asphalt in a varnish solutio thoroughly dry, the coa particularly effective for pr tank exteriors, tractors, roa ing equipment, metal fence in storage, toys, sporting go many other manufactured Usually applied by brush, R 208 may be used as a dip o if properly thinned.

Antifriction bearings being di Rust-Ban 347, a semifluid ty preventative. Later the beari wrapped in waxed pap

ndrymen Consider Factors which uence Castability of Metals

TABILITY of metals was the for the seventh annual conference at Michigan ollege, Lansing, Mich., April nder sponsorship of the Dehapter, American Foundryassociation, and the school's nent of mechanical engineeractors affecting the casting tals were considered under eadings: (1) External influ- and (2) internal reactions.

t of superheat on castability ysical properties of gray iron viewed by N. A. Ziegler and Northrup, Crane Co., Chi- Basis of this paper was a of experiments in which s of gray iron scrap were in an electric induction furCarbon content of the metal typical heats was 3.25, 3.00, 50 and 2.25 per cent.

metal was superheated to 3000 s Fahr., and poured at varymperatures. With exception of es where a low carbon conas desired for a special purt was claimed that best physioperties were found in high iron melted at high tempera- In discussion, one speaker d that melting temperature elatively unimportant factor. g temperature, character of and thickness of metal section formation of ferrite. Ang a question on effect of en, the authors stated that mentation so far does not nt conclusions.

Solidification Control

ussing methods of controlling onal solidification, F. A. Mel- Detroit Steel Casting Co., t, explained that these apply the point of view of casting , heading and gating, and poschilling technique. He de- the theory underlying proe directional solidification of ingots and pointed out that unately, comparatively few gs resemble ingots. As a revarious conflicting factors must nsidered. These include gating eading. In some instances, the metal from the gate enters the through the riser, thereby supg hot metal where it is needed in other instances, where nec- dictates entrance of metal gh a bottom gate, the mold is at one end after it is filled at the riser is at the highest and gravity assists the metal. e speaker also pointed out that while a temperature gradient exists in the metal of the casting, it is probable that effect of this is less significant than that the mold due to passage of the metal over it, has become highly heated locally at the spot where high temperature can do the most good by retarding solidification and enabling the metal to remain fluid for the longest possible time, and thus achieve the greatest degree of feeding.

Head Metal Reduced

Referring to the excessive amount of head metal considered necessary on many steel castings, Mr. Melmoth told of a ring gear in which the reversal method of handling the mold after pouring reduced the number of heads from four to one. The proper angle of reversal from 10 to 180 degrees depends upon local conditions and study of many factors. A little experimentation usually supplies sufficient information to carry on the practice. No claim was made that the method is applicable, or for that matter, necessary on all types of castings. However, many castings can be improved by its adoption, he asserted. The idea is not new, the speaker first saw it in use over 20 years ago.

Effect of sand conditions, alloying additions and melting practices on castability of aluminum alloys was discussed by W. E. Sicha and M. H. Gould, Aluminum Co. of America, Detroit. They reported that some investigation has been done on beryllium alloy additions, but nothing is yet available for publication. It was stated that the most satisfactory and widely used aluminum alloy for many purposes is the one containing 5 per cent silicon.

H. W. Dietert, H. W. Dietert Co., Detroit, presented results of a series of experiments designed to show how condition of sand in the mold affects the physical properties of the casting. It was observed that strength of the iron decreases with an increase of moisture in the sand. Depth of chill increases as moisture increases. Moisture materially reduces metal fluidity.

Strength of test bars decreased with an increase in permeability, indicating that slow-cooled cast metal is stronger than a fast-cooled metal. Deflection decreased with increased permeability.

One session was devoted to effect of internal reactions on castability. In a review of the factors affecting fluidity of metals, W. H. Spencer, Sealed Power Corp., Muskegon, Mich., followed a reference to definition of fluidity and test methods by a description of the effect of moisture, permeability and hardness of the sand, mold facing, position and temperature of the mold. He directed attention to the possibility of error in reading temperatures with the optical pyrometer, particuarly where the surface of the metal is covered with oxide films.

Describing the effect of raw material characteristics on the castability of metal, John Lowe, Holley, Mich., claimed that the function of the cupola is to melt the iron charged and to superheat to such temperature that the metals of different analyses will mix properly, carry a minimum amount of slag, be consistent in analysis and meet the requirements of castable metal.

Dealing with the effect of alloying elements, H. C. Aufderhaar, Electro Metallurgical Co., Chicago, claimed that insofar as low concentrations of alloys are concerned the effect of castability is slight. While there is little in the way of quantitative tests to back this statement, it is well known that thousands of tons of low alloy cast iron are produced annually. Medium and high alloy irons generally require some changes in molding and pouring practice to obtain maximum castability.

Strip Steel Welding Machine Demonstrated

■ Taylor-Winfield Corp., Warren, O., manufacturer of welders, conducted a symposium on welding strip steel, at its plant recently. It consisted of a demonstration of the latest design of Taylor-Winfield full automatic hydraulic strip mill welder with Morton hydraulic flash trimmer.

Following the demonstration a program and discussion of operating problems was presented by officials of Taylor-Winfield, Wean Engineering Co., and Morton Mfg. Co., covering important phases of the welder's design and operation.

Operating and engineering executives of steel companies and various allied industries attended.

Largest Water Supply

■ One million pounds of bronze castings are to be supplied by Koppers Co.'s Bartlett Hayward division, Baltimore, for shafts of the Delaware water shed being constructed by New York city, from Delaware lakes to New York. Project will cost $200,000,000, largest water supply system in the world.

Fast Crane Control

Cranes with wound-rotor motors now can obtain same excellent operating characteristics as those with direct-current motors. Frequency-sensitive relays in new control system permit smooth positioning, accurate inching and speeds up to 150 per cent normal in the lowering direction

By H. L. WILCOX
Asst. Chief Engineer
Electric Controller & Mfg. Co.
Cleveland

■ WHILE THE use of electric relays actuated by frequency of alternating current is not particularly new, their application on a recently developed system of fast crane control makes possible a controller with a number of outstanding advantages.

A factor limiting the flexibility of previous alternating-current crane control, particularly in the lowering direction, is the inherent trait of a slip-ring motor which makes it immune to speed control unless loaded. Unless the crane is equipped with a load brake, the maximum loads that the motor can have in the lowering direction is the friction load with empty hook. As the weight on the hook is increased, this changes to no load and then becomes overhauling, tending to drive the motor, and there is always the possibility, when lowering an overhauling load, that the motor will be accelerated by the load and carried far beyond synchronous speed before the normal control functions operate to limit the speed.

Direct-current crane control makes use of motor field regulation and dynamic braking to hold this condition safely. Previous alternating current control found it necessary to bring the motor quickly to synchronous speed in the lowering direction and there hold it to avoid the possibility of dangerous overspeeds. This resulted in just two speeds for lowering—full speed and stop.

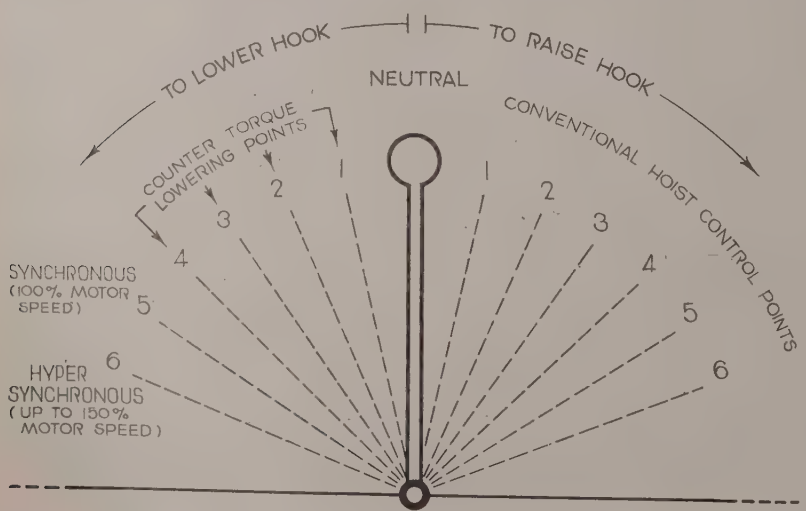
The new system makes use of the inherent voltage and frequency characteristics of the motor secondary to actuate the frequency relays necessary for controlling the motor speeds. In alternating cur ring induction motors, quency of the induced volta rotor circuit is directly pro to the difference between t speed of rotation of the m the synchronous speed. Th ence, expressed in per cent, the slip. Moreover, the indu age itself increases directly slip. This combination of voltage and frequency is i controlling the operation of quency relays which are us new system as accelerati speed limiting devices. Th possible a flexibility of contr lowering direction which heretofore obtainable.

Relay Fully Guarde

The characteristics of thes are such that they function treme accuracy and are not tible to variations due to wea accumulation of dust. The tions in the control system that if the relay should fail reason, the normally closed maintain the control sa though controlability be i

Detailed description of h control operates indicates th advantages and possibilities for improved crane perfo The accompanying sequen gram indicates the control p of a typical controller using system. In the neutral or sition of the master handle, tor is de-energized and brak

To raise the hook, the o moves the master handle to



This diagram shows various o points on the new frequency con tem for use with wound-rotor i motor in crane service

IN BUILDING LIFE INTO WICKWIRE ROPE BEYOND SPECIFICATIONS

Yes, killing time . . . but saving you money! This odd looking device is the latest development in a fatigue testing machine . . . it kills time because in a few hours it gives the wire under test as much punishment as it would receive in years of actual service.

As a result of these tests, we can determine how to draw the long-lived wire that we use in making Wickwire Rope. Thus you can bend and unbend Wickwire Rope over your sheaves and still be sure of getting your money's worth for every rope dollar you spend.

WICKWIRE ROPE

It is still the privilege of the progressive manufacturer to build rope life into his product beyond official specifications.

WICKWIRE SPENCER STEEL COMPANY

General Offices: 41 East 42nd Street, New York City; Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Portland, Seattle. Export Sales Department: New York City

in the hoisting direction which will lift the load on the hook. This may be the first, second or third point, depending upon the torque required, increasing torques being produced as the controller cuts out resistance in the rotor circuit. The first point develops about 50 per cent full load torque at standstill. The second point about 100 to 125 per cent and the third point develops approximately the maximum starting torque of the motor. The first two accelerating contactors are controlled direct from the master switch without accelerating relays. The remaining contactors are controlled by accelerating relays as well as from the master switch. The operator may select the weaker torque of the first and second points for hooking on or for light loads, or he may throw his master full on to the sixth point, in which case the first two contactors close immediately and the remaining points follow by controlled acceleration.

There is nothing unusual about the control functions in the hoisting direction except that the frequency relays, controlling the acceleration, close the accelerating contactors at the precise instant for maximum torque efficiency. Due to the speed torque relations on the slip ring motor, it is not practical to force the acceleration as may be done with a direct current motor. When acceleration has been carried to the point of maximum or pull-out torque of the slip ring motor, further forcing will result in less torque with greater line current. The frequency relays automatically regulate the closing of the accelerating contactors to cut out the rotor resistance just as fast as the motor is able to accelerate its load. This results in a minimum accelerating time under all load conditions without abusing or stalling the motor.

Lowering Control

It is in the lowering direction that this system differs from previous crane controls and it is here that the many advantages of the new system come into play. If the operator wishes to lower the hook, he moves the master handle in the lowering direction. Nothing happens until the fifth point lowering is reached. At this point, down power is applied to the motor with a high resistance secondary to produce a very low torque, just about sufficient to overcome friction. With no load on the hook, acceleration will be very gradual. This provides an ideal condition for inching an empty hook or a light load downward.

If the master is left on the fifth point, the motor will accelerate gradually until, at about half speed, the frequency acceleration relays start to operate and accelerate the motor to synchronous speed. If there is a heavy load on the hook, it will accelerate quicker to half spee
the frequency relays take
and close the accelerating co
to prevent overspeeding.

If the load is overhau
must be lowered consider
tances, such as with a
crane or a magnet crane,
ator moves his master to t
position lowering. This
some secondary resistance
lows the motor to run ab
chronous speed on rege
"Hyper-synchronous" speed
to 175 per cent of synchrono
are entirely safe and save m
in lowering. Should an ext
load tend to exceed the safe
hyper-synchronous speeds,
quency relay will operate
the accelerating contactor
out the step of secondary re
and thereby bring the speed
synchronism just as if the
had returned his master to
point. This feature is especi
uable on magnet cranes
transferring scrap or pig ir
river barges to railroad cars
case the magnet may have t
ered 60 to 80 feet from the
car to the hold of the barge
increased lowering speeds m
increase the handling capa
proportionately reduce the
cost in this service. Anoth
able application for this cor
ture is on magnet cranes
skull cracker duty. By ma
per cent faster lowering spee
able, the capacity of the
greatly increased.

Slowed Lowering

When the operator wishes
down a descending load, he
master handle back naturally
the OFF point. On movi
point 5 to point 4, the l
torque is replaced by weak
torque. This hoisting torqu
counter-torque, since it is in
tion opposed to the rotatio
not be sufficient to reduce t
so the operator pulls the
handle to the third, second
position as may be required
fails to do so, this is autom
accomplished by a frequenc
as described below. A counte
point may be selected whi
stall the load or allow it t
slowly. By this means, medi
heavy loads may be inche
slowly. When the operator
to hold the load, he pulls the
switch quickly to the OFF

This counter-torque slowdo
herent in the control conn
greatly reduces the wear o
shoes by relieving the m
brake of the stopping duty.
erator soon becomes accusto
pulling his master switch t
the counter-torque points s

(*Please turn to Page 6*

Handles Long Wide Sheet Safely

■ This sheet lifter provided with end hooks easily handles a 5-ton load of random size sheet, including 72 x 144-inch stock, with little sag and with no possibility of sheets sliding out of end of stack. The chains are set in notches on head member of lifter. Photo courtesy Cullen-Friestedt Co., Chicago

aft Steel Tubing

oncluded from Page 43)

show a tubular type of con- n more readily lends itself ection and repair because of ssibility. In case of accidents, h impact value of steel is val- It is a rare case that a steel structure is not repaired at able cost.

arch and Development.—Na- Advisory Committee for Aero- at Langley field has pio- and led the way on aerody- research and its value in de- Of equal importance is its n engine development. None- up to this time there has o organization to put into ef- an industry basis or for gov- nt agencies the research com- by N.A.C.A. With this new tory in California, we will for st time be in a position to in- te and develop more definite edge not only concerning steel but many other materials. ntil we have such knowledge government or the aircraft ry in a position to build two re prototypes of different ma- for each new design of planes rsuit, attack, bombing, obser- etc.

oreign Research Ahead

ign research on steel tubing such important subjects as of welding cracks in steel for aircraft. Under this head- ere are available many differ- oreign research papers cov- various subjects such as effect rbon content, effect of cold ng on the steel before welding, of various reagents and cer- ypes of scrap in melting prac- ffect of grain size on crack sivity, benefits obtained by pre- g before welding and also af- elding. Further research in ountry, concerning the specific t of welding seamless tubing rcraft structures, will be ex- ly valuable.

ecent investigation at numer- ircraft plants shows that en- mounts were being processed ree different methods—(1) by ng the normalized tubing with- ny further heat treatment; (2) normalizing the complete en- mount after welding; and (3) enching and drawing the com- engine mount after welding, is, by heat treating to fairly physicals.

rely this would indicate a great of work could be done in finding n of these three methods or new method is preferable. Also nnection with engine mounts, ly tubing for the ring is bent from normalized material and welded without any strain relieving. Obviously bending normalized tubing sets up severe cold working strains which should be relieved before welding. Research and development may show it is preferable to form the ring from annealed material and then heat treat the complete engine mount after welding.

Recent experience at one plant on renormalizing welded parts after welding shows an increase in strength of 75 per cent minimum when compared to parts welded and not renormalized. Of course, this has been obtained by refining the grain structure of the weld area and also by eliminating the annealing effect adjacent to the weld.

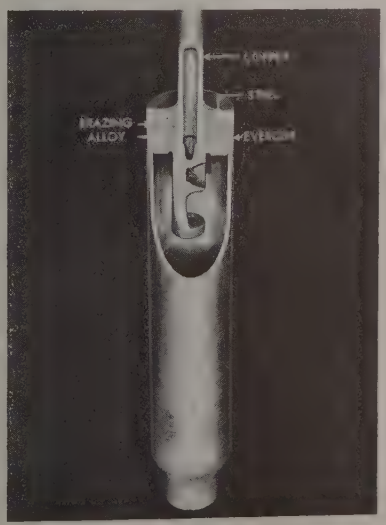
These few suggestions indicate some of the possibilities for immediate research and development on steel tubing.

Silver Alloy Used to Braze Dissimilar Metals

■ An interesting application of low-temperature silver brazing is seen in the accompanying illustration, which shows an electric refrigerator part made up from Everdur, steel and copper. Outer shell of Everdur is brazed to a steel center section, which at the same time is joined to a copper tube.

Brazing alloy used is a low-temperature composition having medium silver content. Known as Easy-Flo, it is made by Handy & Harman, 82 Fulton street, New York. Work is accomplished at 1175 degrees Fahr., using a flux that is fully active at 1100 degrees. High strength and ductility of the bond are said to make the completed assembly sound and gas-tight.

Cutaway view showing refrigerator part in which silver brazing is used to join steel center section to copper tube and an outer shell



650 Attend Ceramic Meeting in Chicago

■ More than 650 members attended the forty-first annual meeting of the American Ceramic society, Hotel Stevens, Chicago, April 16-22. First five days were devoted to business, general and divisional sessions; Friday and Saturday were reserved for visits to plants in the Chicago district.

Members affiliated with the iron, steel and metalworking industries were especially interested in the enamel and refractories divisional meetings. Among papers presented in the enamel division were: "Hairlining of Sheet Steel Enamels," by B. J. Sweo and W. M. Paquin, Ferro Enamel Corp., Cleveland; "Wet Process Leadless Cast Iron Enamels," by B. Niklewski Jr. and A. I. Andrews, University of Illinois, Urbana, Ill.; "Effect of Various Factors upon Abrasive Resistance of Porcelain Enamels," by Clark Hutchison, Ingram-Richardson Mfg. Co. of Indiana Inc., Frankfort, Ind.; "Some Sheet Iron Enamel Defects Traceable to Base Metal or Metal-Forming Operation," by E. E. Howe, Chicago Vitreous Enamel Product Co., Cicero, Ill.; "Laboratory and Shop Performance of Nonreboiling Enameling Sheets," by J. C. Eckel, Carnegie Illinois Steel Corp., Pittsburgh; "Research Activities of Porcelain Enamel Institute," by C. S. Pearce, Chicago.

Refractories division: "Some properties of Semisilica Brick," by G. Bickley Remmey, Richard C. Remmey Son Co., Philadelphia; "Blast Furnace Refractories, Present Application and Possible Future Development," by W. R. McLain, Carnegie-Illinois Steel Corp., Chicago; "A New Kind of Cement for Silica Brick," by J. W. Craig and N. P. Pitt, Canadian Refractories Ltd., Montreal, Quebec; "Small Electric Arc Furnace for Melting and Pouring Glasses and Corrosive Slags," by James A. Taylor, Mineral Industries Experimental station, Pennsylvania State College, State College, Pa.

Buffs Chemically Treated

■ Wear resistance of buffs has been increased by chemical treatment of buffing cloths. Chemicals include a hygroscopic element which absorbs moisture from the air and gives conditioned sheeting at all times. According to Hanson-Van Winkle-Munning Co., Matawan, N. J., originators of this process, the treated buffs also absorb the polishing composition more readily, giving improved cutting and coloring action.

New England Foundrymen Hear Hiring Systems Indicted

■ THIRD regional conference of New England Foundrymen's association held in conjunction with American Foundrymen's association and Massachusetts Institute of Technology attracted some 350 members and guests to the meetings at Cambridge, Mass., April 14 and 15.

Selection methods for original employment were scored by J. Edwin Doyle, long identified with the personnel department, West Lynn works, General Electric Co., now director, division of unemployment compensation, Massachusetts. In any given industry, faulty system of hiring is largely responsible for current problems pertaining to middle-aged employes, some time out of step with modern trends and tempo, according to Mr. Doyle. He favors selective tests rather than the interview method. Yet his experience, over 17 years, with a liberal test involving high school graduates, about 5th grade elementary and college graduates, taking relatively higher quizzes in selective competition, reveals a discouragingly low level. He blames mistakes in hiring at 18 and 20 for many cases of middle-age employe problems.

Credit Unions

Advocating an employe-suggestion system, Mr. Doyle declared a saving of $50,000 had been attained at the West Lynn plant in one year. Establishment of credit unions are favored. Over a period of many years, $800,000 loaned by the Lynn General Electric Union at low interest, a loss of but $61 has been encountered. Employes of that works are the sole stockholders and dividends of 3½ to 8 per cent have been paid regularly.

As regards new social legislation, which he claims results largely from the result of laxity of industrialists, Mr. Doyle urges employers to follow the trend, feeling that inequalities will be ironed out; he predicts additional legislation of the same type unless industry takes the initiative in the social field. He questions why an employer should combat collective bargaining.

Application of spectroscopy in foundry practice for the detection of impurities is increasing, according to Dr. George R. Harrison, professor of physics, Massachusetts Institute of Technology. The spectroscope is being used more by scrap dealers. Increasing content of copper and tin in open hearth steel with the melt of automobile scrap is evident. This is accumulative, more and more tin and copper finding its way into such scrap. As yet this is not a dominant factor in the production of open hearth steel.

According to Dr. Harrison, use of spectroscopy in safety valves has resulted in the alloying of compensating metals of opposite characteristics to obtain a better product.

In the scrap trade checking 150 samples an hour for alloy content is possible, Dr. Harrison claims, while a large midwest foundry makes periodic analysis of melts by the use of spectrographs, the time from inspection to finished print being but nine minutes.

Control of Alloy

Reasonable control of chromium, copper, manganese, molybdenum, nickel and silicon is possible. Dr. Harrison said a practical installation, satisfactory for the average foundry costs approximately $1500. While carbon and sulphur analysis can be made by spectroscopy, it appears uncertain as yet with vacuum methods. Gas atoms are also somewhat difficult to determine, more so than metal, but progress in this direction is being made, according to Dr. Harrison.

The steel metallurgist has contributed much to foundry practice in the development of high test cast iron, says J. S. Vanick, research metallurgist, International Nickel Co., New York. Development of standard specifications for such iron to give engineers confidence in the product for certain recognized properties and strength is still ahead. When such a goal is attained, real progress in high-test cast iron practice will have been made, he said. Commercial grades are being produced up to 60,000 pounds and in some instances higher. In the steel field, Mr. Vanick noted the possibility of increasing the ordinary ingot strength of 50,000 pounds to as high as 125,000 pounds by manipulation of carbon, heat treating, increasing the cooling rate, introduction of allovs or a combination.

Proper handling of the cupola makes it possible to reduce steel content in the product and molybdenum is an aid in building strength with other alloys. Production of high test iron of a tensile strength of 90,000 pounds is still largely in the academic stage as far as production in the cupola is concerned, Mr. Vanick said, although it is readily possible in an air furnace. High test iron or 50,000 pounds tensile strength is being produced in volume in the cupola, however.

Blending of sands for iron and steel castings was discusse open meeting under the le of D. L. Parker, General Co., Lynn, Mass. While n suggestions as to procedu offered, it was generally that the larger productio ries with modern sand equipment were in a better to blend than the average foundry.

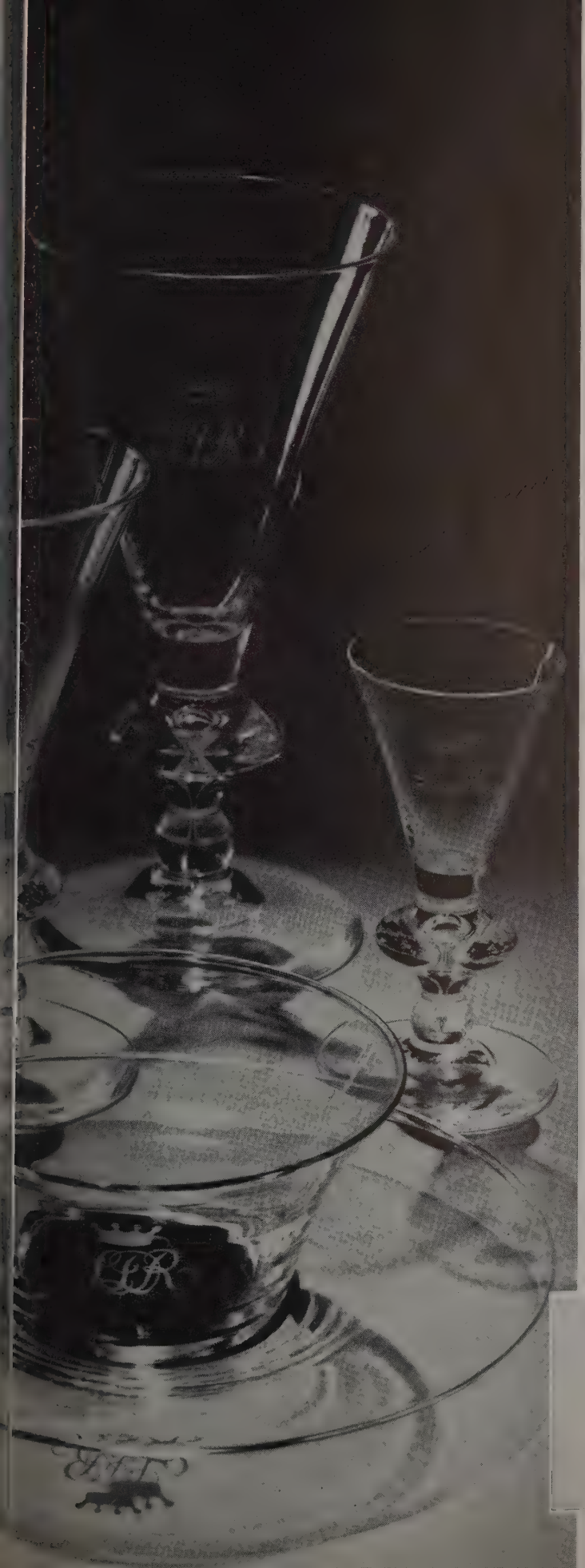
Control of all factors in practice was urged by D. O'Connor, foreman, brass Walworth Co., South Bosto in reviewing production of bronze castings. Customers refining field have raised st Mr. O'Connor showing a s group and intricate castin production of which centers on control of all factors in tion, from design to machin stressed the importance of pheric conditions in foundr tice. In the production of i bronze parts as outlined O'Connor, core baking is approximately 450 degrees the procedure being as slow sible for uniformity.

Open flame and crucible f are used with 700 to 1000 po material per charge. A 15 steel ladle is used in pouring perature, depending on the casting, is usually in a ra 2150 to 2300 degres Fahr., f dium sized work, larger being poured at lower tempe but not under 2100 degrees. A ings are tested with 80 pou pressure under water. Prehea pouring ladle to approximat perature of the metal is ad by Mr. O'Connor.

Uniform Sand Desirabl

Sand, with scores of gra the reason for many variab coreroom experience in the of L. P. Robinson. Now dire core oil sales, Werner G. Smi Cleveland, Mr. Robinson illus his talk with concrete exam malpractice in sand control ar indicating a saving of $150 a in fuel at one foundry re from employment of high sand for specific work. Ur quality of sand eliminates va in core work, he claims, mix important as to moisture a content. The time element portant in mechanical mixing Robinson claiming 90 per ce the mix being overmulled. Th four minutes is enough on num types of core work.

One of the worst variables core room is moisture in Mr. son's opinion, traceable in instances to outside storage of He favors equipment to insur sand for uniformity and cont core making; also closer cont core baking.



☆

How to carve your initials on a Crystal Goblet

Down in Corning, New York a small group of artisans devote their lives to making the famous Steuben ware. This crystal is so clear, so well designed and of such beautiful hand workmanship that it has taken its place in the great museums of the world.

Steuben ware is made entirely by hand, each operation requiring infinite patience and skill. Wherever a design is called for it is put on the crystal by delicate engraving with a copper wheel . . . one of the rarest and most difficult of all the handicrafts. Where a monogram is indicated, the copper engraver is faced with his most exacting task.

An important factor in the operation of the copper wheels is a special abrasive powder manufactured by The Carborundum Company. Mixed with oil, this abrasive is allowed to flow onto the copper in a steady stream. The abrasive action gives an easy smooth cut which enables the engraver to work out the design with the highest degree of precision and artistry.

Thus again, even in an industry where everything is done by hand, the products of The Carborundum Company are helping to produce better work. And in hundreds of cut glass shops, too, Carborundum Brand Abrasives play an important part in the production of beautiful and intricate designs.

AN INVITATION TO EXECUTIVES CONCERNED WITH MANUFACTURING

Whatever you make, there are two ways in which The Carborundum Company's Abrasive Service can help your company. Highly trained abrasive engineers are ready to help solve any special grinding or finishing problem that may confront you. Also, without obligation, they will study your present abrasive set-up, report on its efficiency, and wherever possible, indicate how production can be improved or savings effected. Write to The Carborundum Company, Niagara Falls, N. Y. and a representative will call.

CARBORUNDUM
REG U S BRAND PAT OFF
ABRASIVE PRODUCTS

FOR ACCURACY AND ECONOMY IN MANUFACTURE

Color Drums

Modern fabrication methods and use of shee steel permit economical construction of large group of special lighting units. Steel is formed and joined, using arc, spot and projection welding methods

By CARL F. HERBOLD
Plant Engineer
Westinghouse Elec. & Mfg. Co.
Cleveland

■ ONE OF the outstanding attractions at the New York World's Fair will be the Lagoon of Nations, a body of water large enough to contain all of Radio City. Water jets will spout to a height of 250 feet. Slowly changing colors from 585 unusual underwater floodlights will be trained on these spouts and controlled from a single point to produce a countless number of beautiful effects.

The floodlights are in reality two units in one housing. Each housing is a fabricated tank of 12-gage steel, welded watertight with a single bead. Fig. 1 illustrates forming a tank side on a power brake. There are 12 bends to each tank on four pieces; side, two ends and a cover. The tank side on its last bend passes over the top of the brake ram. Before forming, the sides have had some flat pads spot w position to serve as moun for wire clamps and fus Tank ends have a reinforc nel to carry supporting p the rotating units.

Universal Fixture

Operator in the foregroun 2 is tack welding ends to side. Universal fixture u has a base plate 4 feet wi feet long and built of 6 beams, mounted on free-roll ers. Leveling jacks are corner. Top surface ha planed and scored on 12-inch down the length and 6-inch across the width—making sary to use only a 12-inch s any layout.

Gaps between top flange beams have been machined mit using special T-bolts fo ing the angles and other plates. Angles are made o inch steel slabs, 18 inches face and 40 inches on the These were likewise planed and tapped holes on 6-inch and clearance holes between, 6-inch centers, permit clamp angles to the table, or ma the angles.

A fixture of this type is i sable for fabrication, es when accurate relationship parts is to be maintained. tack welding the members t the second welding operatio in the background, comple job with an outside single bea In addition, two cross-brace ing brackets are added ins tank. Outside 12 clevis clips, in bushing and two pipe which later serve as trunnio welded in place. A groundi

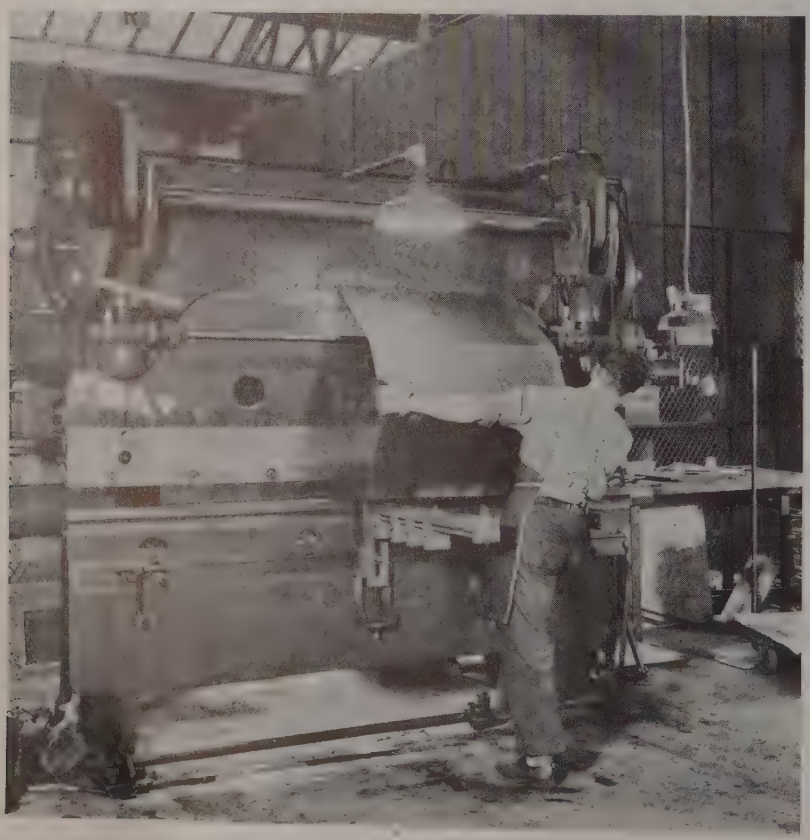


Fig. 1—Forming a tank side on brake

PEAL TO THE EYE WITH WELDED DESIGN

AIR example is this stand, of bases and frames used on nachines. On the left we have rmer construction—a collec- parts bolted together. On the e have the design of today— unit of welded pressed steel, lined for eye appeal and sales.

Cost has been cut from $28.70 to $12.64—a saving of $16.06. Breakage troubles have been eliminated. And the new model can be supplied in any desired height without extra cost for patterns or delay. This is just one example of how this manufacturer improved gate receipts by giving welding a FAIR chance to gain *headway* in the plant.

What's the key to this *headway? Appoint a HEAD-MAN*—a Profit

Crusader with a flair for driving costs down and quality up with welding. When you're courting Miss Progress 1939, the old saying still goes, "Faint heart ne'er won FAIR lady." Let Lincoln give you some pointers on successful approach.

Largest Manufacturers of Arc Welding Equipment in the World

THE LINCOLN ELECTRIC COMPANY

DEPT. Y-597 **CLEVELAND, OHIO**

minal also is brazed on the outer surface.

With all the details assembled to the tank, it next is sandblasted to clean welds and prepare the metal surface before painting. All tanks are pressure tested for watertightness and then are given a protective coating against corrosion, the inside of the tank being painted dead black on a red oxide primer.

Covers for the tanks have two windows, or openings, cut out on a nibbling machine. Additional miscellaneous parts such as gasket guides, lens-holding bars and baffle separator are spot welded to the door. A specially treated heat-resisting glass is used for windows. Door is held securely to the tank by 12 clamps. A breather permits tank to "exhale" as it heats when in operation and to "inhale" during cooling when lamps are extinguished.

Into each tank goes two color drums. Each unit co cast-iron cradle which lamp socket, motor, refle ballast transformer for th lamp in the case of th units. A progressive ass was set up to build these units, 585 using the 1500- lamp and 585 using the capillary mercury lamp. rotate drums is furnishe phase 208-volt synchrono 1800 revolutions per mi integral gear reduction o rated 1/75-horsepower.

The cradle hangs in the a 6-sided cage assembly revolved about it, drive motor through an 18.7:1 gear reduction, thereby one revolution per minu color drum. Glass panels as the color filters on drums. On the incandes there are red, blue-gree canary, clear and blank tions. Clear, dark-blue, pink and two blank-out pos provided for the mercury

Synchronizing Contr

Cage assembly consists spiders joined by spread Each spider is a die-cast h ing a ball bearing, and h eted six arms made fro sheet-steel channel. On o is fastened the spur gear the motor pinion is meshe assembly turns on spindl lock in sockets on the t and are clamped by loc screws in the hubs of th For control purposes, there lay and limit switch on e These enable the operator tate the 1070 color drums them into step, and then the direction of rotation to the color cycle and obtain desired effects as he choose

Detail wiring is done on grounds, but before each co is assembled in its tank, th is phased out and the lead for phase rotation. Mesh also is checked as is crad ment. When fully adjusted, is added and blank-out pa in place, making the uni for final installation in the

Fig. 4 illustrates a color d ing lowered into the tank. T drum may be seen already tion. The A frame support tank, which allows adjustm the desired angle also can clearly in this lineup. Bush the multiconductor cable is

Fig. 2. (Top)—Tackwelding the the tank side. Fig. 3. (Cent sembly line. Fig. 4. (Bottom drum being lowered into co tank

oreground near top edge of

ation is one of the undis-
evelopments of the current
all indications are that it
even more widely employed
gners in the future. These
ums and their tank housings
cal examples of such design
rication. They represent an
te weight of 90 tons, most
is some form of sheet-stock
o suit the application. Every
welding is employed—arc,
nd projection. Projection-
uts and screws are used;
the subassemblies are made
welding, accurately con-
by electronic timing. Arc
for this job totals over two
f bead. From a standpoint
power, these 585 floodlights
nt 4000 man-hours.

♦

ng Handbook New
in Old Field

ing Handbook, by Waldemar
s and Donald C. Fabel;
30 pages, 6 x 9 inches; pub-
y American Society for Met-
eveland; supplied by STEEL,
nd, for $7.50; in Europe by
Publishing Co. Ltd., Caxton
Westminster, London S.W.1.

neer in presenting a treatise
gings and forging practice,
lume treats of an industry
han written history, perhaps
ncient of the mechanical arts.
e of its antiquity and the con-
levelopment in recent years
as been written on the sub-
The authors found research
ied by paucity of previous
tions but also encountered
ty in obtaining accurate au-
material.

eneral, material and informa-
ave been drawn from expe-
of the forging field and those
with it. Every source was
d and unpublished handbook
p Forging institute used.
Naujoks, chief engineer, Steel
vement & Forge Co., Cleve-
prepared seventeen sections
lited the entire book. Mr.
head of mechanical engineer-
enn college, Cleveland, wrote
sections. More than 400 photo-
s, sketches, tables and charts
ry phase of plant operation
roduction embellish the text.
jects include forge plant equip-
die blocks, dies and tools,
e, finishing operations, heat
ent, cleaning, testing and in-
n, materials handling, forge
design, maintenance, furnaces,
of forged part, forging ma-
, job estimating, cost engi-
g, safety, forging definitions,
matical tables and data.

Analysis of 1938 Pig Iron Output

■ PIG IRON production in 1938 totaled 18,546,070 gross tons, 17,583,526 tons, or 48.66 per cent less than 36,129,596 tons in 1937, according to the American Iron and Steel institute. This is the smallest tonnage since 1934, with 15,676,889 tons.

Pennsylvania held its position as largest producer, 4,835,969 tons, compared with 11,371,238 tons in 1937. Ohio was second, 4,210,514 tons; Indiana-Michigan district third, 2,347,315 tons. Alabama was fourth with 2,023,268 tons, displacing Illinois, which produced 1,656,591 tons.

Output of ferroalloys totaled 614,791 tons, compared with 997,681 tons in 1937, a decrease of 382,890 tons, 38.37 per cent. Production in 1938 included 290,790 tons of ferromanganese and spiegeleisen, 282,521 tons of ferrosilicon and 41,480 tons of other ferroalloys.

Basic pig iron totaled 12,888,079 tons; bessemer and low phosphorus 3,053,702 tons; foundry 1,570,582; malleable 1,002,435 tons; forge or mill 687 tons; white and mottled, direct castings and others 30,585 tons.

Of the total iron output in 1938 15,591,146 tons, 84.06 per cent, was for maker's use and 2,954,924 tons, 15.94 per cent, for sale. In 1937 makers used 82.1 per cent; in 1936, 83 per cent. In 1913 only 69.2 per cent was used by makers.

Machine Tools Praised For Raising Standards

■ A. G. Bryant, president, Bryant Machinery & Engineering Co., Chicago, and president, Associated Machine Tool Dealers of America, addressing Philadelphia machinery distributors recently, stressed importance of machine tools in improving standards of living.

He called attention to price reductions on manufactured goods through the use of machine tools, and increased employment as a direct result. Improved tools give better products at lower prices, an important contribution by the tool industry.

Mr. Bryant asked co-operation through local and national groups, because selling is a more difficult task than 30 years ago.

PRODUCTION OF PIG IRON AND FERROALLOYS

(All Figures Are Gross Tons)

Pig Iron	1934	1935	1936	1937	1938
Pennsylvania	4,244,566	5,479,792	9,102,875	11,371,238	4,835,969
Ohio	4,207,944	5,634,530	7,206,655	7,903,944	4,210,514
Indiana, Michigan	2,184,546	2,898,478	4,168,299	4,722,316	2,347,315
Alabama	1,171,650	1,297,960	1,998,212	2,580,674	2,023,268
Illinois	1,269,154	2,003,388	2,917,016	3,426,116	1,656,591
Massachusetts, New York	1,053,257	1,415,755	2,220,522	2,843,286	1,303,217
Md., Va., West Va., Ky., Tenn.	1,318,964	1,781,171	2,102,106	2,531,457	1,813,352
Minn., Iowa, Colo., Utah	226,808	269,686	500,862	750,565	355,844
Total	15,676,889	20,780,760	30,216,547	36,129,596	18,546,070
Ferroalloys					
Pennsylvania	164,776	219,947	330,463	437,315	164,899
New York, New Jersey	140,711	195,281	243,176	259,583	190,430
Ohio, Iowa, Colorado	116,402	113,147	164,173	172,379	152,748
Va., West Va., Ala., Tenn.	39,795	63,564	74,828	128,404	106,714
Total	461,684	591,939	812,640	997,681	614,791
Grand total	16,138,573	21,372,699	31,029,187	37,127,277	19,160,861

PIG IRON MADE FOR SALE IN 1938

States	Basic	Bess. and low phos.	Foundry	All Other	Total
New York	50,028	32,146	190,983	116,482	389,639
Pennsylvania	193,813	75,006	85,275	68,269	422,363
Md., W. Va., Ky., Ala., Tenn.	209,981	3,760	816,134	11,330	1,041,205
Ohio	27,338	20,886	134,944	284,723	467,891
Indiana, Illinois	103,546	19,887	50,834	388,372	562,639
Michigan, Iowa, Colorado, Utah	631	.....	70,001	555	71,187
Total	585,337	151,685	1,348,171	869,731	2,954,924

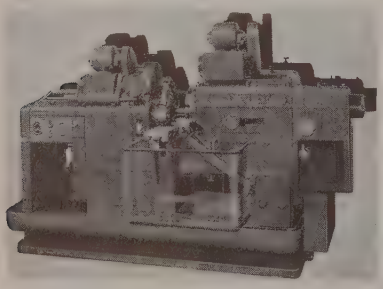
PRODUCTION OF PIG IRON AND FERROALLOYS IN 1938

(For sale and for maker's use)

Pig Iron	For sale	For maker's use	Total
Basic	585,337	12,302,742	12,888,079
Bessemer and low phosphorus	151,685	2,902,017	3,053,702
Foundry	1,348,171	222,411	1,570,582
Malleable	857,159	145,276	1,002,435
Forge or mill	687	.....	687
White and mottled, direct castings, etc.	11,885	18,700	30,585
Total	2,954,924	15,591,146	18,546,070
Ferroalloys			
Ferromanganese and spiegel	112,393	178,397	290,790
Ferrosilicon	282,162	359	282,521
Other ferroalloys	40,957	523	41,480
Total	435,512	179,279	614,791
Grand total	3,390,436	15,770,425	19,160,861

Parallel Operations on Automatic Screw Machine

■ Cleveland Automatic Machine Co., Cleveland, announces Model 2AA single spindle automatic screw machine, styled by Wilbur Henry Adams and capable of simultaneously performing primary and secondary operations. Chuck has capacity for round bars up to 1 1/16-inch diameter, will feed up to 6½ inches and has maximum turning length of 4 inches. Drum-type turret has 6 positions with indexing time from 2¼ to 3½ seconds. Spindle is mounted in pre-loaded antifriction bearings and has speed range from 203 to 3275 revolutions per minute. Maximum to minimum feed ratio for



any spindle speed is 20:1, with infinite feed adjustments within range.

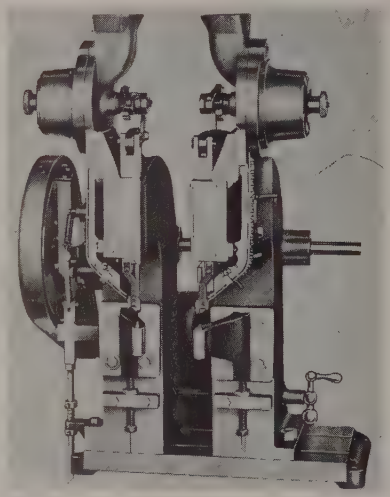
Attachments are provided for secondary operations. One of these, individually motor-driven, is shown above spindle. Possible operations on cut-off end of work include: Slotting, slabbing, drilling, reaming, burring, threading and tapping, etc. When cut off, work is gripped by one of the turret positions and indexed opposite attachment while another piece goes through primary cycle of automatic. Work is not rehandled in going from primary to secondary stages.

There are two independently operated cross slides. An independently actuated cutting-off slide also can be furnished as an attachment. The basic machine also has provisions for quick mounting of additional attachments.

Rivet Setting Machine Has Adjustable Center

■ Chicago Rivet & Machine Co., 1830 South Fifty-fourth street, Chicago, has developed a multiple automatic rivet setting machine which is capable of setting two rivets at one time. It has adjustable center feature which permits using model on various assemblies where same general style of rivet is used.

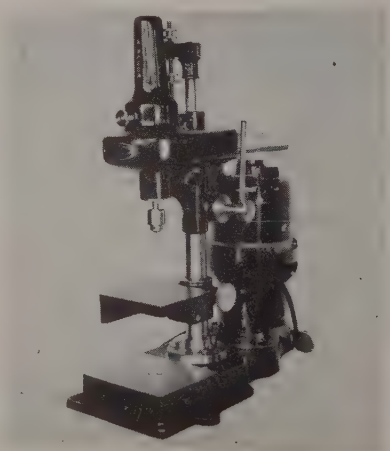
Adjustment of heads is easily at-



tained by turning ball crank at right of machine. Machine is claimed to be quick, efficient and accurate. It has throat depth of 6 inches and center pin is adjustable from 7/16-inch to 7 inches.

Adds 4-Speed Machine For Sensitive Drilling

■ High Speed Hammer Co., Rochester, N. Y. has added to its line a 4-speed precision drilling machine with speeds of 750, 1500, 3000 and



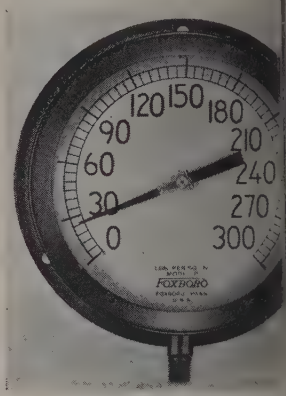
top of 6000 revolutions pe

Range of machine is f
80 to ¼-inch drills. Becau
creasing demand for sensi
ing machine with proper s
tool steels, stainless and oth
alloy steels, spindle spee
revolutions per minute wa
This speed is useful also i
drilling operations in slate a
nonmetallic materials.

Gage Is Constructe Of Arc Welded Stee

■ Foxboro Co., Foxboro
has devised an indicating g
all-welded steel constructio
plications where there are
vapors corrosive to bronze.

Special Chapmanized stee
brinell rating is used in pin
ment, arbor and connecting
this gage. Segments and
have milled teeth and m
plates, columns, links and
screws are made of stainle
Threaded rings, equipped w

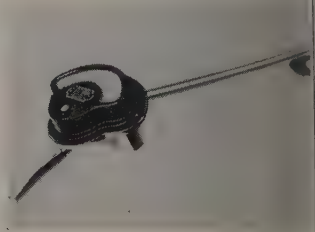


ets, make the gage moistu
vapor proof and to retain
glass firmly in place.

The 270-degree bourdon
makes possible the use of
double the range of gage
increasing movement multip
or decreasing accuracy.
molybdenum steel is used.

Immersion Pyromete

■ Harry W. Dietert Co.,
announces FerroTemp, a pyr
unit for accurately measurin
perature of molten iron by



re's a NEW and BETTER slushing compound–

GULF OILCOAT NO. 1

Easily applied — long lasting — protects highly finished metal surfaces.

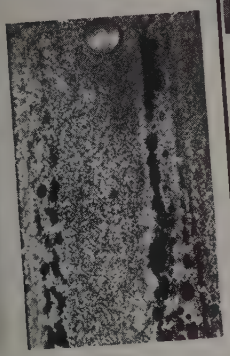
THERE is now available to you an improved material to protect highly finished surfaces of steel and non-ferrous metal products against corrosion — GULF OILCOAT NO. 1. This product is an entirely new type of slushing compound, developed by Gulf technologists after many years of research and field tests.

While GULF OILCOAT NO. 1 provides a thin film which is not easily rubbed off by handling, it may be readily removed by conventional solvents. Accelerated laboratory corrosion tests, as well as field tests with all types of metals, have established the superiority of this new type of slushing material over products formerly used for this purpose.

GULF OILCOAT NO. 1 can be applied by any conventional method and lasts for a long period of time. It is nominally priced and economical to use. Ask the Gulf representative who calls on you to give you further details — or fill in and mail the coupon below for complete information.

Exhaustive accelerated corrosion tests have been conducted in the Gulf laboratory to determine the effectiveness of GULF OILCOAT NO. 1 as compared with ordinary slushing compounds. The metal samples at the left tell the story.

Here's Proof!



These two similar pieces of metal, one slushed with GULF OILCOAT NO. 1 and the other with a conventional slushing compound, were exposed to highly corrosive influences for the same length of time. The superior value of GULF OILCOAT NO. 1 is clearly demonstrated by the perfect condition of the metal plate on the left.

GULF INDUSTRIAL LUBRICATION

. IN AND MAIL THIS COUPON

S.

Gulf Oil Corporation—Gulf Refining Company,
Room 3813, Gulf Building, Pittsburgh, Pa.

Please send me complete information and price quotations on GULF OILCOAT NO. 1.

Name.....

Company.....

Address.....

of an immersion thermocouple. Temperature scale reads from 1600 to 3200 degrees Fahr., and smallest division is 20 degrees. Maximum temperature is indicated 15 seconds after immersion. Depth of immersion does not affect reading, and a stabilizing treatment insures accuracy through life of couple, which is better than 100 immersions. Iron and slag do not adhere to couple. FerroTemp also is available in a wall type model. Weight of portable model illustrated is 8 pounds, overall length 47 inches.

Vertical Unit Does End Milling Up to ½-Inch

■ Blank & Buxton Machinery Co., Jackson, Mich., has introduced the No. 39 highspeed vertical mill for end mill work up to ½-inch.

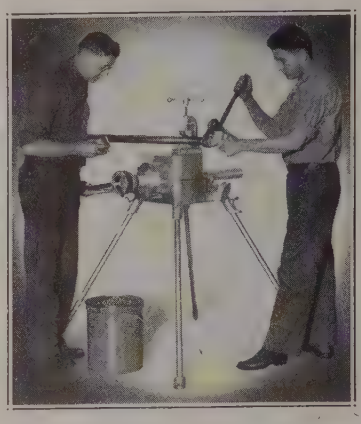
Unit has an 8 inch cross travel and 16-in longitudinal travel. Maximum distance from end of spindle to

table is 15 inches, and distance from center of spindle to column is 8¼ inches. Spindle runs in preloaded ball bearings mounted in a quill having 3¼-inch vertical travel. It is driven by a heavy duty V-belt through a 6-step cone pulley. Table screws and screws for controlling vertical movement of the spindle are equipped with micrometer dials graduated in thousandths of an inch.

Adapter Converts Hand Tools Into Pipe Machine

■ Beaver Pipe Tools Inc., Warren, O., has added to its line the Model-C power adapter for converting hand tools into a portable pipe and bolt machine. Unit is designed for bench or stand use and conforms fully to recognized standards in machine-tool practice.

Gears are fully enclosed, and large driving gear operates in an oil bath. A conventional geared chuck is used, and is tightened or loosened by turning a standard chuck wrench. The model-C will thread pipe up to and including 2-inch with solid, full-width dies at a speed of about 22 revolutions per minute, and will

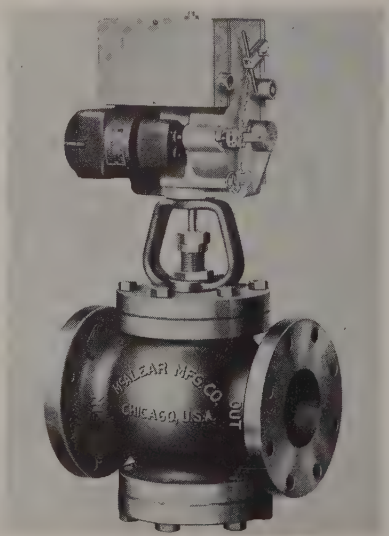


thread bolts up to 1½-inch. Unit will operate geared tools to thread pipe up to 8-inch.

Machine is designed so that two men can work conveniently at the same time—one threading, the other bending or making up fittings. Net weight of this bench unit is approximately 140 pounds. Motor used has a nominal rating of ½-horsepower.

Electric Valves Will Operate in Any Position

■ McAlear Mfg. Co., 1901 South Western avenue, Chicago, has introduced its No. 1100 electrically op-



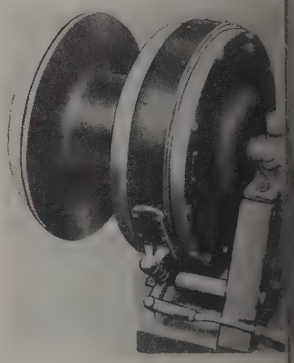
erated valves, furnished in all sizes up to 6 inches, both single and double-seated, flanged or screwed, and in ferrous or nonferrous bodies and trim.

These units will operate in any position and are supplied for 110 volts, alternating current, with brush typ Gear train is enclosed and grease. All gears are ma steel. Unit is provided v ty torque limit device w vents damage to power u obstruction lodge inside v prevent it from seating. vided with means for valve by hand.

Unit is equipped with sn limit switches and can be for various speeds of stroke

Hydraulic Clutch

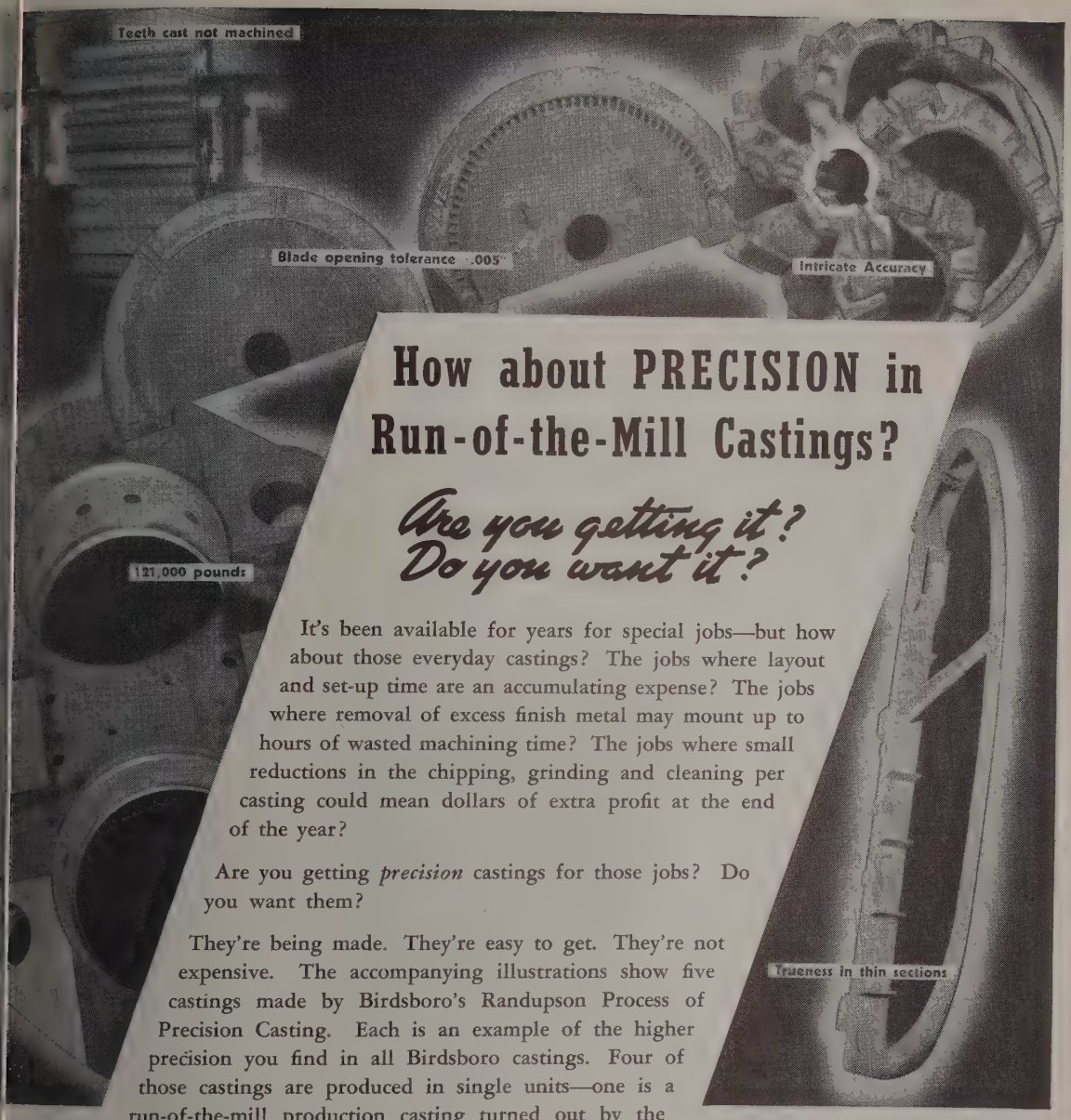
■ Fray-Mershon, Inc., 5 Windsor road, Glendale, C developed a slow speed he hydraulic clutch. Reco maximum speed is 200 revo minute. Clutch has no plat ing, and operates entirely either horizontal or verti tions and under water if n There is no throw-out bea



operator cannot slip clutch tip control can be adapte mote control. Clutch cann free-wheels perfectly and drag. Response is instar The clutch is self-energiz greater the load, the tig clutch holds.

Bar Sizing Machine With Indicator

■ Taylor-Wilson Mfg. Co., 2 son avenue, McKees Rocks, placed on the market a fa



How about PRECISION in Run-of-the-Mill Castings?

Are you getting it? Do you want it?

It's been available for years for special jobs—but how about those everyday castings? The jobs where layout and set-up time are an accumulating expense? The jobs where removal of excess finish metal may mount up to hours of wasted machining time? The jobs where small reductions in the chipping, grinding and cleaning per casting could mean dollars of extra profit at the end of the year?

Are you getting *precision* castings for those jobs? Do you want them?

They're being made. They're easy to get. They're not expensive. The accompanying illustrations show five castings made by Birdsboro's Randupson Process of Precision Casting. Each is an example of the higher precision you find in all Birdsboro castings. Four of those castings are produced in single units—one is a run-of-the-mill production casting turned out by the hundreds. Can you pick the one?

Unbelievable as it seems, it's the one with the ± .005" blade opening tolerance—a turbine diaphragm.

This is a story of a truly unusual ability and it's worth a check-up. Send today for our illustrated folder, "The Randupson Process of Precision Castings", or better yet —if you are near Birdsboro, Pa., drop in and let us show you precision castings in the making.

STINGS • HYDRAULIC MACHINERY • STEEL AND CHILL ROLLS • STEEL MILL EQUIPMENT • SPECIAL MACHINERY • CRUSHING MACHINERY

BIRDSBORO

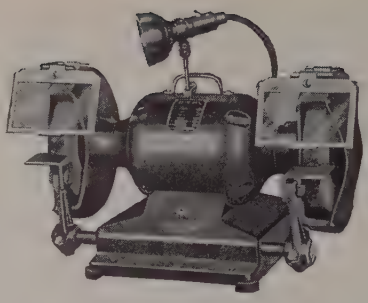
STEEL FOUNDRY AND MACHINE COMPANY

PLANTS AT BIRDSBORO AND READING, PENNSYLVANIA

roll machine for straightening, sizing and burnishing round bars. Adjustment is simplified by indicators showing exact position and angle of roll. Rolls can be changed in 20 minutes. Delivery speed is limited only by size of driving motor; 60 to 180 feet per minute are attained. No wabblers or universal joints are used.

Illuminated Heavy Duty Bench Grinder

■ Diehl Mfg. Co., Elizabeth, N. J., has introduced a heavy duty bench grinder with adjustable shatterproof



eyeshields and illumination by a non-glare daylight lamp. Grinding wheels are fully-enclosed except for working sector. Tool rests are adjustable. Motor is ball bea enclosed dust-tight, and with a 10-foot rubber cab grinder is finished in bl with chromium plated fitt coarse-grain and one grinding wheels 7 inches eter with a 1-inch face are Listed at $47.50 for ½ h 220 volts, single phase.

Valve Positioner fo Use on Control Val

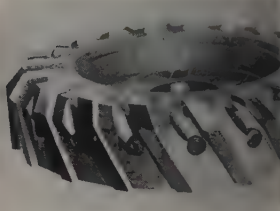
■ Bristol Co., Waterbury, C developed a valve positione on diaphragm control valve come effect of friction in v and top.

Pneumatic device is clai desirable for use on all ai control installations wh

control is of great import particularly on those where considerable lag. Positione proportionate valve stem t even slightest change in pr air from controller.

Cutters Shed Chips

■ Ingersoll Milling Mac Rockford, Ill., offers Shea Face Mills. These milling have edges set at negative steep positive shear angles.



of cutting angles are broad fered off to direct chips o

rom cut. It is claimed this
s chips packing face of cut-
scoring finished surfaces.

Capacity Breaker

Circuit Breaker Co., Phila-
, has developed type ET-20
purpose circuit breaker for
ecially where concentration
er requires 20,000 ampere in-

ting capacity. Each pole is
ed with an inverse time ther-
overload and instantaneous
tic trip feature operating on
mon trip. Trip units are inter-
eable, calibrated and contained
ealed case. Breakers are trip
f handle and cannot be held
against heavy overloads or
circuits.

Countersunk-head
ts In Fuselage

nkins-Johnson Co., Jackson
has developed a machine

automatically feeds and sets
ersunk-head rivets in straight
or curved aircraft fuselage or wing structures. Locating and riveting is done at eye level, clearly visible to operator. Work is pressed against rivet head during riveting and a completely filled hole is assured without flashing. Foot-pedal operation leaves operator's hands free. Uniform pressure is applied to each rivet. Pressures up to 12,000 pounds are available. Machine is capable of setting rivets up to 3/16-inch diameter and 1 inch long and handles up to a 5/8-inch length differentials without change of tooling. Machine also can be tooled for round-head rivets.

Flame Control

■ Wheelco Instruments Co., Chicago, announces a "Photo-Head" flame control unit as an adjunct to its "Flame-otrol". Unit is sensitive to a luminous flame but not to heat, and may be used in conjunction with a standard electrode. Hermetically sealed, the unit may be used in ovens which may be above or below atmospheric pressure. To guard against extraneous light, unit has a cover switch which will shut off fuel should unit cover be removed. A manual reset also guards against

(*Continued on next Page*)

Fast Crane Control

(*Concluded from Page* 54)

reach the OFF point about the time the motor comes to rest and the brake sets in time to hold the load.

Previous to this system it was not entirely safe to use counter-torque for retarding or lowering heavy loads. If the operator left his master switch on a point of counter-torque which was too weak to restrain the load, the speed might reach dangerous proportions. In this new scheme, a frequency relay takes control when the lowering speed on counter-torque approaches full speed and automatically applies a stronger torque for slow down.

Another important use for the frequency relay is on controllers designed to provide quick stop by plugging the motor; that is, by reversing the power applied to the motor to bring it quickly to rest at which point the plugging power is removed. A frequency relay designed to operate precisely at standstill frequency is used to open the reverse torque contactor at the instant the motor comes to rest. This eliminates the use of the so-called "zero speed switches" or other mechanical devices geared to the machine to interrupt the plugging power when the motor has been brought to rest.

Since the frequency relay operates on a resonant circuit, it can be made responsive to practically any value of frequency from 3 to 150 cycles and so has a wide range of application. There is little doubt, however, that its use as an accelerating or plugging relay in the new crane control system described is one of its most important applications. With accurate control of inching operations in the down direction, counter-torque lowering points permitting accurate regulation and safe lowering of all overhauling loads within the capacity of the crane, and by making possible hyper-synchronous lowering speeds to increase the output, this development promises to be significant in the field of crane control.

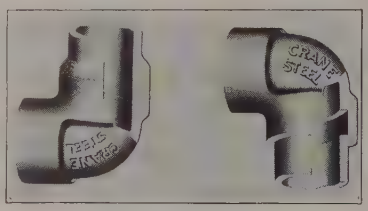
Flame Control

(*Continued from Page* 67)

excessive heat. Photo-Head utilizes a photo-electric cell responsive to a specific light radiation coming from flame through an optical filter.

Fittings For Small Welded Pipe Lines

■ Crane Co., Chicago, has introduced a line of socket welding fittings for small lines. Proportioned



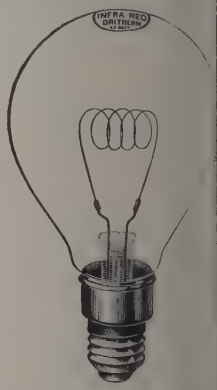
for welding, walls assure proper heat penetration and distribution. Deep sockets provide liberal come and go in assembly of pipe line. Pipe length and cutoff need not be accurate when pipe does against socket shoulder. surface is easily gotten must butt shoulder. Althou high pressure and tempera ings, these fittings also ar for much lower ratings.

Glass Held Flexibly In Welding Helmet

■ American Optical Co. bridge, Mass., announces f ing helmets and four han of vulcanized fiber in eith cated or one-piece cons Helmets have a free-floatin outside friction joint. Welc cover glass are held fle cushion any shock. Glass changed easily without s or risk of breaking. Fibe of shields is deeply groove

Radiant Drying La

■ North American Electri Lamp Co., St. Louis, has d Dritherm lamp for radian and heating purposes. Long



life, high efficiency, unifor filament materials, placem carbon filament within the t rugged construction are cla

Variable Load Sprin

■ Two new variable load for trucks and buses on chassis have been develo Maremont Automotive P Inc., Chicago. The springs greater deflection than an spring. As the load increa second stage of the spring into play and stiffens the The springs also are desig keep chassis height in posit

■ February mechanical stok reported to the department merce were 2561 units, all si types, compared with 2502 a for the same month in 1938 a respectively. February sales dential sizes were 1995 uni for bituminous and 210 for cite.

n Craftsmanship

(Concluded from Page 39)

nt of the workers as-
operate it, and the more
ted to its operation and

asked this manufacturer
ng of equipment due to
perience of operators did
normally high under such
, he replied: "Surprising
seem, it does not. These
operators take pride in
hines and in their work
nsequence they treat them
ideration which would be
thy in many an American
f good equipment reacts
way upon the untutored
nind, it would seem that
ble effect here in enlight-
erica should call for very
ment.

g Rounds
ercing

(Concluded from Page 46)

being moved by the walk-
s. These refractory piers,
mber, run from the charg-
f the furnace to the soak-
h as shown by the cross
f the furnace. See Figs.

rnaces were placed in op-
bout the middle of Febru-
, and no trouble has been
ed. The savings in fuel
kers' time have been sub-
A considerable increase in
of the mill, compared with
by conventional furnace,
realized. Tests made upon
ckled and weighed before
passing through the fur-
w a scale loss of 0.75 per
ss, depending upon the time
was in the furnace.

ad Brake Uses
osition Shoe

e which brings trains trav-
100 miles an hour to a
stop within 2500 to 3000
nnounced by Budd Wheel
ladelphia. A composition
used which exerts pressure
aircooled drum, similar to
utomobiles, mounted on the
le the wheel. Fins on drum
ipate braking heat and cool
pecial control devices auto-
prevent wheels from slid-
n brakes are suddenly ap-
is eliminating "flat" wheels.
ces and higher efficiency are
The first complete train
with the new brakes is the
Pershing" zephyr of the
n lines.

Detroit A.S.T.M. District Committee Reviews Industrial Test Methods

■ INDUSTRIAL applications of new testing methods in four fields were summarized at the fourth annual spring meeting of the Detroit district committee of the American Society for Testing Materials in Detroit, April 19. A four-paper symposium constituted the technical session which followed a dinner meeting attended by 113. T. A. Boyd, General Motors Research Laboratories, and chairman of the Detroit district committee, introduced T. G. Delbridge, national president of the society, and C. L. Warwick, secretary-treasurer, who reported at some length on general activities of the society.

Testing of steels for high-temperature service was discussed by Dr. A. E. White, director of the department of engineering research, University of Michigan, Ann Arbor, Mich. He considered three groups of steels—plain carbon, low-alloy, and austenitic types. Whereas at one time it was held by some that composition played no part in the high-temperature properties of plain carbon or low-alloy steels, it is now recognized that chemical composition is an important factor. In addition, steelmaking practice, metallographic constituents, distribution of constituents and grain size all influence, in some cases to a marked degree, the high-temperature properties of the steels in question. For example, the creep properties of a given type of steel of presumably the same chemical composition are affected by as much as 100 per cent by the type and size of metallographic constituents.

Short-Time Properties

Among the tests used on steels for high-temperature service are those for torsion creep, hardness, wearing characteristics, seizing characteristics, tension creep, stress rupture and resistance to oxidation. Dr. White confined his remarks to tests to determine the short-time high-temperature properties of steel, tension creep tests, stress rupture tests and tests for surface stability. He presented details of equipment and technique for each of these tests, together with slides depicting the results obtained with different types of steels.

R. M. Van Deusen, Detroit Edison Co., in discussing Dr. White's paper, cited some preliminary creep test results obtained in sections of thin-wall steel tubing welded into superheater pipes operating at 1000 degrees Fahr. Two types of steel being tested, one a 1.25 chromium, 0.5, molybdenum and 1.3 silicon steel, the other carbon-molybdenum steel, were compared for creep results in laboratory and field tests. While fair agreement was noted between the two types of tests, the different combination of stresses encountered in the field produced somewhat different results than those obtained from laboratory tests.

Photomicrographs were made to show the degree and rate of scale formation in this type of service of low-carbon 18-8 steel, several low-alloy steels and S. A. E. 1010 steel. Comparison of scale depth after exposures at 3800 hours and at 7600 hours revealed that scale formed more rapidly at first, then tapered off as the exposure lengthened.

Oxidation Is Investigated

Results of a wide range of tests on automobile engine oils made in the effort to correlate new oxidation tests with service data were presented by H. G. Mougey, General Motors Research Laboratories. Various oils were given 4000-mile runs in engines, varying operating conditions such as crankcase ventilation, crankcase temperature, speed, etc. Temperature was found to be the most important factor affecting ultimate condition of the oil and its effect on engine surfaces. Studies also were made with inhibitors and catalysts added to both superior and inferior grades of oils, noting the end effects. The Underwood laboratory test for determining the amount of oxidation products and their character was described in detail.

Dr. Gordon C. Harrold, chief chemist of the industrial hygiene department, Chrysler Corp., discussed dust and ventilation problems in industrial operations, together with methods and equipment for collecting and measuring the quantity of various types of dust particles, gases, vapors, mists and the like present in industrial atmospheres. He emphasized the difficulties attendant upon obtaining representative and large enough samples for test purposes.

Microscopic and drop test methods for measuring metallic electrodeposits were described briefly by J. W. Higgins, chief chemist, Packard Motor Car Co. He observed that the purpose of electroplatings is twofold—either to provide added appearance qualities or to improve protection of the base metal. On platings for appearance it is necessary to measure the quality of the plate; on those for protection it is necessary to measure the

Mr. Higgins detailed ... and procedure for ma... tests on cadmium, zinc ... ium platings, and microsc... for other electrodeposits.

Survey Shows Italy ... Essential Minerals

(*Concluded from Pa...*

survey made for Secreta... merce Hopkins by depa... perts.

Italy is largely depend... eign countries for coal an... and the Italian heavy met... less developed than the Ge...

During 1938, 862,829 to... iron were produced, comp... 789,892 tons in 1937. Pro... steel ingots and castings ... 1938 amounted to 2,322,... compared with 2,086,905 to... In 1938, iron ore produce... amounted to 1,011,451 t... pared with 1,016,270 tons ... vious year.

The survey shows prod... automobiles in Italy after i... sharply in 1937 was fairly ... tained in 1938. Shipbuild... tained its activity on both ... and foreign account; the lo... Italian costs appears to b... the small wages paid. It ... also in the survey that imp... Italy from the United St... tended to be more and mo... to a few primary products. ... scrap iron and steel is one...

Growth of Hot Iro...

■ How cast iron "grows" ... at elevated temperatures. ... "growth" was measured ... resistance determined are ... in Ohio State university's ... ing Experiment Station Bu... 100, "Measuring the Gr... Scale Resistance of Ca... Copies are obtainable fr... neering Experiment Stati... Ohio State university, C... O., Price 25 cents (includ...

"Rivet-Bolt" Appro...

■ The Dardelet "Rivet ... licensed by the Dardelet Th... Corp., New York, has been ... by board of standards and ... New York, for use in ... structures up to 200 feet i...

This new fastening has ... head similar to that of the ... with a ribbed grip portion ... greater in diameter than ... structural steel. Grip leng... with thickness of steel ... Self-locking thread is fo... nut in assembly, thus grea... ing structural noise.

)eclining Trend Partly Arrested

Additional Recession In Demand, Steelmaking More Gradual

MARKET IN TABLOID ★

Demand
Settling at slower rate; small-lot buying rules.

Prices
Remain to be tested; scrap slightly steadier.

Production
Dropped 1 point to 50½ per cent, low for year to date.

L ingot production has receded further to a for the year to date at 50.5 per cent. Fin-el demand also has given additional ground, the rate of decrease is less rapid.

ave trimmed steelmaking in accordance with ler volume of new business and specifications, e an additional reduction is indicated in some soon, little prospect is seen of an abrupt col-activity the remainder of this quarter.

estimates call for no more than a seasonal in operations into the summer. This would a mid-year bottom of 40 to 45 per cent.

raging factors in steel markets are not en-sent. Structural shapes and reinforcing bars active; tin plate demand is increasing more household equipment manufacturers are fair-sales out of warehouse have turned upward districts; and automobile assemblies last week a new high for the year to date.

nent, although far from bullish, has been aided y the steadier stock market and by the slight f tension over the European situation. How-el buyers continue cautious and small lots rule siness.

plants have yet to be pinched by the soft coal although precautionary measures in the con-of coal and coke supplies partly are reflected week's banking of nine blast furnaces and one en battery. These shutdowns principally were Pittsburgh and Youngstown districts.

Of Ore Shipping Latest In Years

al lake ore boats, loaded with coal for shipment hern ports but delayed in starting by ice at cer-ints on the route, have been unloaded at Lake cks to supplement waning stocks of lower lake ers. Opening of the ore shipping season ap-ikely to be the latest in at least ten years, the of cold weather the past few weeks. Ore in-also are slow to appear.

mobile output has expanded for three successive contrary to some recent predictions, but curtail-n parts releases and quiet in steel buying indicate the spring peak is at hand, unless retail buying shows unexpected gains. Last week's assemblies of 90,280 units compare with 88,050 the week before and 60,563 a year ago.

Chrysler accounted for practically all of the latest upturn, increasing from 20,725 units to 23,625. General Motors dropped from 34,680 to 34,405 and Ford from 22,230 to 21,480, while all others gained from 10,415 to 10,770.

Outstanding in railroad markets are the placing of 15,167 tons of rails by the Erie and 2400 tons by the Nickel Plate. Maine Central has ordered 300 freight cars, while an inquiry from Brazil involves 1000 freight cars and 25 locomotives. However, equipment building prospects are less favorable since action has been postponed by several roads on car buying under consideration early this year.

Tin Plate Demand Gains; Operations 63 Per Cent

Tin plate production is a trifle higher at 63 per cent, with demand the best of recent weeks and somewhat heavier than was expected a short time ago.

Pig iron shipments so far in April are 10 per cent smaller than a month ago in several leading districts.

The 1-point drop in steelmaking last week left output 18 points above the level a year ago, although this is the smallest margin to date in 1939. Reductions in various districts were less drastic than a week ago, Pittsburgh being off 2 points to 43 per cent, while Chicago was steady at 53½ and Youngstown held at 43. Eastern Pennsylvania slipped 1½ points to 38½, Detroit was down 2 points to 57, Cleveland declined 3 points to 36½ and Cincinnati dropped 5 points to 46.

Buffalo was up 2 points to 46½, with other districts unchanged. These included Birmingham at 60, St. Louis at 44½, Wheeling at 65 and New England at 35.

Scrap prices continue soft, but the recent decline has been arrested, at least for the present, and the composite is unchanged at $14.46. Finished steel prices are receiving little test, with the composite holding at $56.50.

COMPOSITE MARKET AVERAGES

	Apr. 22	Apr. 15	Apr. 8	One Month Ago Mar., 1939	Three Months Ago Jan., 1939	One Year Ago Apr., 1938
Iron and Steel	$36.29	$36.32	$36.40	$36.40	$36.36	$38.61
Finished Steel	56.50	56.50	56.50	56.50	56.50	61.70
Steelworks Scrap..	14.46	14.46	15.04	14.98	14.77	12.30

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, ... pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, sh... hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Y...

Finished Material

	April 22, 1939	March 1939	Jan. 1939	April 1938
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.45c
Steel bars, Chicago	2.25	2.25	2.25	2.50
Steel bars, Philadelphia	2.57	2.57	2.57	2.765
Iron bars, Terre Haute, Ind.	2.15	2.15	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.215	2.215	2.465
Shapes, Chicago	2.10	2.10	2.10	2.30
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.445
Plates, Chicago	2.10	2.10	2.10	2.30
Sheets, hot-rolled, Pittsburgh	2.15	2.15	2.15	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.45
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.50	3.80
Sheets, hot-rolled, Gary	2.15	2.15	2.15	2.50
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.25
Sheets, No. 24, galv., Gary	3.50	3.50	3.50	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$37.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	April 22, 1939	March 1939	Jan. 1939
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.3
Basic, Valley	20.50	20.50	20.5
Basic, eastern, del. Philadelphia	22.34	22.34	22.3
No. 2 foundry, Pittsburgh	22.21	22.21	22.2
No. 2 foundry, Chicago	21.00	21.00	21.0
Southern No. 2, Birmingham	17.38	17.38	17.3
Southern No. 2, del. Cincinnati	20.89	20.89	20.8
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.2
Malleable, Valley	21.00	21.00	21.0
Malleable, Chicago	21.00	21.00	21.0
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.3
Gray forge, del. Pittsburgh	21.17	21.17	21.1
Ferromanganese, del. Pittsburgh	85.33	85.27	90.2

Scrap

Heavy melting steel, Pittsburgh	$15.25	$15.75	$15.0
Heavy melt. steel, No. 2, E. Pa.	13.50	13.375	13.1
Heavy melting steel, Chicago	12.75	14.25	13.7
Rails for rolling, Chicago	17.25	17.25	17.7
Railroad steel specialties, Chicago	14.75	16.25	16.0

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.7
Connellsville, foundry, ovens	5.00	5.00	5.0
Chicago, by-product fdry., del.	10.50	10.50	10.5

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Chicago, Gary	2.15c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown, O.	2.15c
Youngstown, O.	2.15c
Birmingham	2.15c
Pacific Coast points	2.65c

Cold Rolled

Pittsburgh	3.20c
Chicago, Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown, O.	3.20c
Youngstown, O.	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.95c
Pacific Coast	4.65c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold strip	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	
Gulf ports	
Birmingham	
St. Louis, del.	
Pacific Coast points	

Tin and Terne I...

Tin Plate, Coke (bas...

Pittsburgh, Gary, Chica...	
Granite City, Ill.	

Mfg. Terne Plate (ba...

Pittsburgh, Gary, Chica...	
Granite City, Ill.	

Bars

Soft Steel

(Base, 3 to 25 ton

Pittsburgh	
Chicago or Gary	
Duluth	
Birmingham	
Cleveland	
Buffalo	
Detroit, delivered	
Philadelphia, del.	
Boston, delivered	
New York, del.	
Gulf ports	
Pacific Coast points	

Rail Steel

To Manufacturing T...

Pittsburgh	
Chicago or Gary	
Detroit, delivered	
Cleveland	

.....	2.10c
m	2.10c
.....	2.45c
st points	2.70c

Iron

Terre Haute...	2.15c
ia	2.47c
, refined....3.50-8.00	

Reinforcing

et, straight lengths, d by distributors

Gary, Buffalo	
Birm., Young.,	
's Pt., Pitts....	2.05c
elivered	2.15c
.....	2.40c
ast ports.....	2.50c
hia, del.	2.22c

el, straight lengths, d by distributors

h, Gary, Chi-	
Buffalo, Cleve-	
Birmingham....	1.90c
elivered	2.00c
s	2.25c
ast	2.35c

Products

ue.-Chicago-Birm. base lb. keg in carloads

wire nails	$2.45
oated nails	$2.45

(Per pound)

staples	3.15c
ce staples	3.40c
bed wire, stand-	
2½ gage two-	
og, 80-rod spool	
wo-point cattle,	
spool.....	$2.62
fence wire....	2.95c
ice wire.....	3.35c
ire fencing (base	
olumn)	67.00
oop bale ties,	
L. column)...	56.00

anufacturing Trade

its. - Cleve. - Chicago- gham (except spring wire)

ess., basic wire..	2.60c
ed wire	2.65c
ire	3.20c

r, Mass., $2 higher on basic and spring wire.

Nails

, Pittsburgh.....$3.60

Finished Bars

	Carbon	Alloy
gh	2.70c	3.40c
.....	2.70c	3.40c
d.	2.70c	3.40c
.....	2.75c	*3.50c
d	2.70c	3.40c
.....	2.70c	3.40c

ered.

Bars (Hot)

Base, 3 to 25 tons)

gh, Buffalo, Chi-	
Massillon, Can-	
Bethlehem	2.80c
delivered	2.90c

Diff.	S.A.E.	Alloy Diff.
..0.35	3100.....	0.70
...0.75	3200.....	1.35
...1.55	3300.....	3.80
...2.25	3400.....	3.20
5 to 0.25 Mo.....		0.55
20 to 0.30 Mo. 1.50-Ni.....		1.10
80-1.10 Cr.		0.45
spring flats		0.15
rs		1.20
ring flats		0.85
Van.		1.50
Van.		0.85
ring flats		0.15
ring rounds, squares		0.40

ric furnace up 50 cents.

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham....	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Youngs., Pitts., Chicago, Birm...	2.25c

Cold strip, 0.25 carbon and under, Pittsburgh,	Cleve.,	Pitts.
Cleveland, Youngstown	2.95c	
Chicago	3.05c	
Detroit, del.	3.05c	
Worcester, Mass. ...	3.15c	
Carbon	Cleve.,	Pitts.
0.26—0.50.....	2.95c	
0.51—0.75.....	4.30c	
0.76—1.00.....	6.15c	
Over 1.00.....	8.35c	

Worcester, Mass $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill.....	$40.00
Relay rails, Pittsburgh 20—100 lbs. 32.50-35.50	
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality..	39.00

Cents per pound

Angle bars, billet, mills.	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham.	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller.....68.5 off	
Do. larger, to 1-in.....66 off	
Do. 1⅛ and larger.....64 off	
Tire bolts .....52.5 off	

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts .....60 off	
Elevator bolts .....60 off	
Plow bolts .....68.5 off	

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less..	67	70
⅞—1-inch	64	65
1⅛ and larger..	62	62

Hexagon Cap Screws

Upset, 1-in., smaller.....67.5 off

Square Head Set Screws

Upset, 1-in., smaller.....75.0 off	
Headless set screws.....70.0 off	

Piling

Pitts., Chgo., Buffalo....	2.40c
Gulf ports	2.75c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago ...	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve....65-10 off	
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld..	27½	14
9 to 12 lap weld...	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm..$42.00-43.00	
4-in., Birmingham..	45.00-46.00
4-in., Chicago.....	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point..	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm..	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago..	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to $\frac{9}{32}$-inch incl.	43.00
Do., over $\frac{9}{32}$ to $\frac{11}{64}$-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur...	$3.75
Connellsville, fdry..	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry....	6.50- 6.75
Wise county fdry...	5.50- 5.75
Wise county fur....	4.50- 4.75

By-Product Foundry

Newark, N. J., del..	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens..	10.50
New England, del..	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens.	7.00
Indianapolis, del....	10.00
Cincinnati, del.....	9.75
Cleveland, del.....	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del..	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol...	16.00c
Toluol, two degree.....	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia....$28.00	

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.12	.....	.....	.....
Boston from Everett, Mass.	22.50	23.00	22.00	23.50
Boston from Buffalo	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birminghom	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic
St. Louis, northern	21.50	21.50	22.5
St. Louis from Birmingham	†21.12	.....	20.6
St. Paul from Duluth	23.63	23.63	

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Stanc $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur	
Pitts. dist. fur.	20.50	do., del Chicago	
		Lyles, Tenn.	

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., o is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burn grains, net ton f.o Chester, Pa., and Ba timore bases (bags.

Do. domestic

Do., f.o.b. Chewel Wash., net ton, bulk net ton, bags

Quickset magnesi grains, f.o.b. Chew lah, Wash., net t bulk

Basic Brick

Net ton, f.o.b. Baltim mouth Meeting, Ches

Chrome brick

Chem. bonded chrome

Magnesite brick

Chem. bonded magnesi

Fluorspar, 85-5

Washed gravel, du paid, tide, net ton

Washed gravel, f.o.b. I Ky., net ton, carload all rail $17, barge

No. 2 lump

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2¼ carbon 88.00
2% carbon, 93.00; 1% 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained

chrome	16.50c
Do., ton lots	17.25c
Do., less-ton lots	17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.00
Do, smaller lots 2.10

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c

88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 ⅛-in., lb.
Do, 2%
Spot ¼c highe

Silicon Briquets, contra carloads freight a lowed, ton
Carload, spot
Less-ton lots, lb.

Manganese Briquet contract carload bulk freight allowe lb.
Ton lots
Less-ton lots
Spot ¼c higher

Zirconium Alloy, 12-15% contract, carload gross ton
Do, spot
34-40%, contract, car loads, lb., alloy
Do, ton lots
Do, less-ton lots
Spot ¼c higher

Molybdenum Powder 99%, f.o.b. York, Pa 200-lb. kegs, lb.
Do, 100-200 lb. lots
Do, under 100-lb. lots

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24
.....	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.61
(Metropolitan)...	3.94	4.11	4.11	3.76	3.75	5.56	3.40	4.60	4.50
.....	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.33
.....	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
.....	4.00	4.15	....	3.85	3.85	5.20	3.90	....	5.40
.....	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
.....	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
.....	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.62
.....	3.43	3.58	3.83	3.75	3.80	5.42	3.58	4.65	4.74
.....	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
.....	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
.....	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
.....	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
.....	3.72	3.87	3.87	3.47	3.47	5.07	3.53	4.47	4.53
.....	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
.....	4.00	4.15	4.15	3.95	3.95	5.71	3.90	....	5.25
.....	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
.....	4.64	4.79	4.79	4.41	4.41	6.01	4.47	....	5.47
.....	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
.....	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
.....	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25
.....	3.65	3.85	5.20	3.40	3.50	5.25	3.95	....	4.75
.....	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75
.....	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	4.75
.....	3.65	4.05	6.00	3.60	3.60	5.20	3.60	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE: Cold Drawn Bars 2300	3100
.....	3.61	4.18	4.28	7.65	6.25	6.00	8.05	8.73	7.33
.....	3.66	4.14	4.14	7.50	6.10	5.85	....	8.69	7.29
.....	3.66	4.11	3.85	7.46	6.06	5.81	8.71	....	....
.....	....	4.10	3.95	....	....	....	....	....	....
.....	....	4.20	....	....	....	....	....	....	....
.....	3.57	3.80	3.80	7.25	5.85	5.60	7.65	8.25	6.85
.....	3.35	3.70	3.80	7.35	5.95	5.70	7.75	8.35	6.95
.....	3.35	3.80	3.70	7.45	6.05	6.05	7.85	8.25	6.85
.....	3.55	3.85	3.58	7.57	6.17	5.92	7.39	8.55	7.15
.....	3.60	4.05	3.90	7.59	6.19	5.94	8.99	8.60	7.20
.....	3.65	3.80	3.80	7.25	5.85	5.60	7.65	8.25	6.85
.....	....	4.39	4.00	7.60	6.20	8.79	9.34	8.94	7.54
.....	....	3.93	3.93	7.48	6.08	5.83	7.88	8.48	7.08
.....	3.76	4.07	3.92	7.62	6.22	5.97	8.02	8.62	7.22
.....	4.46	4.60	....	....	....	....	....	....	....
.....	....	4.61	....	....	....	....	....	....	....
.....	....	4.44	....	....	....	....	....	....	....
.....	....	4.84	....	....	....	....	....	....	....
.....	....	4.73	....	....	....	....	....	....	....
.....	5.00	5.10	....	....	....	....	....	....	....
.....	....	5.60	5.65	....	7.80	7.65	8.45	....	....
.....	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
.....	4.45	6.50	4.65	9.40	8.55	8.40	9.05	10.40	9.55
.....	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

*ed on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, April 20

Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channe or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
50-3.00 Si...	$23.45 5 0 0	$17.47	2 1 0
ner.....	....	16.61	1 19 0
Phos. .03-.05	26.97 5 15 0*	.....	.....
.....	$34.59 7 7 6	$38.34	4 10 0
No. 5 gage..	53.35 11 7 6	42.60	5 0 0
ils.....	$44.56 9 10 0	$48.99	5 15 0
ars.....	2.30c 11 0 0	1.85c to 1.95c	4 15 0 to 5 0 0
hapes.....	2.09c 10 0 0	1.85c to 1.90c	4 15 0 to 4 17 6
in or 5 mm.	2.29c 10 18 9	2.10c to 2.34c	5 7 6 to 6 0 0
ck, 24 gage n.....	2.72c 13 0 0	3.02c	7 15 0*
, 24 ga., corr.	3.29c 15 15 0	3.61c	9 5 0
strips.....	2.77c 13 5 0	1.97c to 2.00c	5 1 0 to 5 2 6
base.....	4.08c 19 10 0	2.39c to 2.83c	6 2 6 to 7 5 0
wire, basc..	4.86c 23 5 0	3.07c to 3.17c	7 17 6 to 8 2 6
base.....	.....	2.73c to 2.93c	7 0 0 to 7 10 0
box 108 lbs.	$ 4.73 1 0 3	.....	.....

*rromanganese $80.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5.	$23.22	4 19 0(a)	$16.44	620.50	$15.17	450	$25.26	63
Basic bess. pig iron..	21.69	4 12 6(a)	.....	...	.....	...	27.86(b)	69.50
Furnace coke.....	5.39	1 4 2	5.96	225	6.81	202	7.62	19
Billets.....	34.59	7 7 6	25.04	945	28.98	860	38.69	96.50
Standard rails.....	1.99c	9 10 0	1.56c	1,300	2.06c	1,375	2.38c	132
Merchant bars.....	2.42c	11 12 0††	1.44c	1,202	1.65c	1,100	1.98c	110
Structural shapes...	2.17c	10 8 0††	1.41c	1,173	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.....	2.29c	10 19 3††	1.82c	1,515	2.06c	1,375	2.29c	127
Sheets, black.....	3.08c	14 15 0§	2.17c	1,805‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm....	3.61c	17 .5 0	3.30c	2,750	4.13c	2,750	6.66c	370
Plain wire.....	4.08c	19 10 0	1.92c	1,600	2.48c	1,650	3.11c	173
Bands and strips...	2.58c	12 7 0††	1.71c	1,340	1.95c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	13.75-14.00
New Eng. del. No. 1	14.00
Buffalo, N. 1	13.50-14.00
Buffalo, No. 2	11.50-12.00
Chicago, No. 1	12.50-13.00
Chicago, auto, no alloy	11.00-11.50
Chicago, No. 2 auto	10.00-10.50
Cincinnati, dealers	11.00-11.50
Cleveland, No. 1	13.50-14.00
Cleveland, No. 2	12.50-13.00
Detroit, No. 1	10.00-10.50
Detroit, No. 2	8.50- 9.00
Eastern Pa., No. 1	15.50
Eastern Pa., No. 2	13.50
Federal, Ill.	11.75-12.25
Granite City, R. R.	11.50-12.00
Granite City, No. 2	10.50-11.00
Los Angeles, No. 1	12.50-13.50
Los Angeles, No. 2	11.00-11.50
N. Y. dock No. 1 exp.	12.00-12.50
Pitts., No. 1 (R. R.)	16.25-16.75
Pittsburgh, No. 1	15.00-15.50
Pittsburgh, No. 2	14.00-14.50
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	10.50-11.00
San Francisco, No. 1	12.00
Seattle, No. 1	12.00
Toronto, dlrs. No. 1	9.75-10.25
Valleys, No. 1	14.25-14.75

COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	11.75-12.25
Chicago, dealer	10.75-11.25
Cincinnati, dealers	10.75-11.25
Cleveland	12.75-13.25
Detroit	11.00-11.50
E. Pa., new mat.	15.50
E. Pa., old mat.	11.00-11.50
Los Angeles	12.50-13.00
Pittsburgh	15.00-15.50
St. Louis	9.50-10.00
Valleys	13.75-14.25

BUNDLED SHEETS

Buffalo, No. 1	11.50-12.00
Buffalo, No. 2	10.50-11.00
Cleveland	10.00-10.50
Los Angeles	14.00
Pittsburgh	14.00-14.50
St. Louis	7.00- 7.50
Toronto, dealers	8.25

SHEET CLIPPINGS, LOOSE

Chicago	8.00- 8.50
Cincinnati, dealers	6.50- 7.00
Detroit	7.75- 8.25
†Los Angeles	3.75- 4.00
St. Louis	6.00- 6.50

BUSHELING

Buffalo, No. 1	11.50-12.00
Chicago, No. 1	11.25-11.75
Cincin., No. 1, deal.	7.00- 7.50
Cincinnati, No. 2	2.00- 2.50
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	10.00-10.50
Valleys, new, No. 1	13.50-14.00
Toronto, dealers	4.25- 4.75

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	6.50- 7.00
Chicago	6.50- 7.00
Cincinnati, dealers	4.50- 5.00
Cleveland	7.50- 8.00
Detroit	5.00- 5.50
Eastern Pa.	9.00- 9.50
Los Angeles	4.50- 5.00
New York	†3.50- 4.00
Pittsburgh	9.75-10.25
St. Louis	3.00- 3.50
Toronto, dealers	4.25- 4.75
Valleys	8.75- 9.25

SHOVELING TURNINGS

Buffalo	7.50- 8.00
Cleveland	8.00- 8.50
Chicago	7.50- 8.00
Detroit	6.00- 6.50
Pitts., alloy-free	11.25-11.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	6.75- 7.25
Cincinnati, dealers	3.00- 3.50
Cleveland	8.00- 8.50
Eastern Pa.	6.50- 7.00
Detroit	5.75- 6.25
New York	†2.50- 3.00
Pittsburgh	8.75- 9.00
Toronto, dealers	5.25- 5.75

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	12.50-13.00
East. Pa., elec. fur.	13.50
St. Louis	9.50-10.00
Toronto	4.50- 4.75

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†5.00
Buffalo	6.75- 7.25
Chicago	5.50- 6.00
Cincinnati, dealers	3.00- 3.50
Cleveland	8.00- 8.50
Detroit	5.75- 6.25
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.50- 3.00
Toronto, dealers	4.25- 4.75

RAILROAD SPECIALTIES

Chicago	14.50-15.00

ANGLE BARS—STEEL

Chicago	15.00-15.50
St. Louis	13.50-14.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	15.50-16.00
Chicago, leaf	14.50-15.00
Eastern Pa.	17.50-18.00
Pittsburgh	18.00-18.50
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, dealers	16.50-17.00
Detroit	16.50-17.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.25-18.75
St. Louis, 2 ft. & less	16.25-16.75

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	13.00-13.50
Cleveland	16.50-17.00
Pittsburgh	17.00-17.50
St. Louis	13.00-13.50
Seattle	16.00

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	13.00-13.50

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

PIPE AND FLUES

Chicago, net	7.50- 8.00
Cincinnati, dealers	6.50- 7.00

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.00- 6.50
Eastern Pa.	13.00
New York	†8.50- 9.00
St. Louis	9.00- 9.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	16.00-16.50
St. Louis, No. 1	10.25-10.75
St. Louis, No. 2	12.00-12.50

FORGE FLASHINGS

Boston district	†8.50
Buffalo	11.50-12.00
Cleveland	11.50-12.00
Detroit	9.00- 9.50
Los Angeles	9.00
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	17.00-17.50
Pitts., billet, bloom, slab crops	19.00-19.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	15.50-16.00
Eastern Pa., crops	17.50-18.00
Pittsburgh	17.50-18.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.00-17.50
New York	†14.50-15.00
Eastern Pa.	17.00-17.50
St. Louis	16.00-16.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†15.00
Chicago, net	17.50-18.00
Eastern Pa.	21.00-21.50
St. Louis	18.00-18.50

LOCOMOTIVE TIRES

Chicago (cut)	15.00-15.50
St. Louis, No. 1	13.50-14.00

SHAFTING

Boston district	†15.25-15.75
New York	
Eastern Pa.	
St. Louis, 1¼-3¾"	

CAR WHEELS

Birmingham	
Boston dist., iron	
Buffalo, steel	
Chicago, iron	
Chicago, rolled ste	
Cincin., iron, deal	
Eastern Pa., iron	
Eastern Pa., steel	
Pittsburgh, iron	
Pittsburgh, steel	
St. Louis, iron	
St. Louis, iron	

NO. 1 CAST SCRAP

Birmingham	
Boston, No. 1 mach.	
N. Eng. del. No. 2	
N. Eng. del. textile	
Buffalo, cupola	
Buffalo, mach.	
Chicago, agri. net	
Chicago, auto net	
Chicago, railroad ne	
Chicago, mach. net	
Cincin., mach. deal	
Cleveland, mach.	
Eastern Pa., cupola	
E. Pa., mixed yard	
Los Angeles, net	
Pittsburgh, cupola	
San Francisco, del.	
Seattle	
St. Louis, cupola	
St. Louis, agri. mach.	
St. L., No. 1 mach.	
Toronto, No. 1, mach., net	

HEAVY CAST

Boston dist. break	
New England, del.	
Buffalo, break.	
Cleveland, break, net	
Detroit, auto net	
Detroit, break	
Eastern Pa.	
Los Ang., auto, net	
New York, break.	
Pittsburgh, break	

STOVE PLATE

Birmingham	
Boston district	
Buffalo	
Chicago, net	
Cincinnati, dealers	
Detroit, net	
Eastern Pa.	
New York, fdy.	
St. Louis	
Toronto dealers, net	

MALLEABLE

Birmingham, R. R.	
New England, del.	
Buffalo	
Chicago, R. R.	
Cincin., agri., deal	
Cleveland, rail	1
Eastern Pa., R. R.	1
Los Angeles	1
Pittsburgh, rail	1
St. Louis, R. R.	1

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbes.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbes.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60% nom.	9.00- 9.50
Tungsten, sh. ton unit, duty pd. nom.	19.00-19.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb.	molybdenum contained, f.o.b. mill

Manganese Or

Prices not including d
per unit cargo

Caucasian, 50-52% nom.	
So. African, 50-52% nom.	
Indian, 49-50%	2

ets, Strip

d Strip Prices, Pages 72, 73

gh—Quiet in automotive ing is tempered by better from household appliance nd from jobbers. The re- line in production has f, sheet production holding y below 55 per cent. Cold out is 35 to 40 per cent, mills are off a trifle at Galvanized sheet opera- higher at 61.

nd — New business in d strip has suffered more average of other prod- r this month, although the decline has moderated lately. ents of household equip- akers are fairly steady bsence of further improve- emand from drum manu- is quiet, while the call for ve material reflects recent down of parts releases. eliminary inquiries for 1940 eel have yet to result in e orders.

o — Business is fairly moderate improvement in from makers of household t tending to offset lighter ents of automotive inter- ntinued quiet is expected resent in buying of motor

York Buying shows little with most leading con- drawing against contracts. ld equipment makers are to place some fill-in orders rounding out the season's n. Jobber buying is light.

lelphia—Sheet orders are some sellers reporting busi- e slowest in many weeks. bstantial tonnages for 1940 ile models are expected to sed within the next three weeks. Makers of house- liances are fairly active but ing little tonnage.

lo—Sheet and strip produc- s been reduced in line with d orders. Little more than emand from the automotive is in prospect prior to or- r 1940 models. Miscellane- rs provide best support to rket.

nati—Shipments are well d, but buying has receded. tive demand shows the shrinkage, needs of other holding. Makers of house- quipment are steady con- though at somewhat below ected rate.

uis—Demand continues slow, s this month having been disappointing. Galvanized roofing is moving slowly to the South, but the general manufacturing trade is taking lighter gages more actively. Heavy rains have retarded operations in Illinois oil fields and have curtailed movement of tank plates.

Birmingham, Ala. — Production and sales of sheets hold to a satisfactory rate.

Plates

Plate Prices, Page 72

Chicago—Plate demand is fairly active, stimulated by heavier requirements for structural projects and railroad equipment. Tank fabrication, refinery equipment and various public works are contributing factors.

New York—Miscellaneous plate demand is quiet, with tank and boiler makers operating well below normal for this period. Outstanding railroad business is an estimated 2500 tons for 300 gondolas placed recently by the Maine Central. J. F. Pritchard & Co., Houston, Tex., will build a high-pressure refrigeration, extraction and recycling plant in Anderson county, Tex., for Tide Water Associated Oil Co. and Seaboard Oil Co.

Philadelphia—Plate sellers are participating in a moderate distribution by the Reading Co. for equipment repairs. However, plate business generally is dull.

Birmingham, Ala.—Prospects for plate business are considerably brighter than actual current demand, although some business is being booked in small and widely scattered lots.

Seattle—Plate demand is restricted to lots of less than 100 tons for small tanks and boilers. No large projects are in prospect.

San Francisco — Few plate inquiries are pending, and most are less than 100 tons. So far this year 15,532 tons have been placed, compared with 12,428 tons a year ago.

Tin Plate

Tin Plate Prices, Page 72

Tin plate releases are the heaviest so far this year. Improvement has been greater than was indicated late in March and volume is well ahead of a year ago, though somewhat below expectations at the opening of 1939. Operations are a trifle higher at 63 per cent.

Better specifications from larger canmakers for both sanitary and general line can material are accompanied by more optimistic predictions regarding vegetable packs. A more rapid upturn in demand is looked for in May, with the peak attained about June 1.

Bars

Bar Prices, Page 72

Cleveland—Little new automotive business is appearing, and preliminary inquiries being issued in connection with 1940 models indicate only small additional tonnages will be required to complete 1939 model production. Specifications from other consumers are small though fairly well sustained in number. Bar prices generally are steady.

Chicago — Demand has slackened since early April in some directions, chiefly from automotive sources. Miscellaneous buying is holding well, while bar requirements of industrial and heavy farm tractor builders are sustained.

New York — Business in cold-drawn and hot alloy bars is less active. Automotive buying is lighter, while specifications from machinery builders have been reduced and poor demand continues from railroads. Orders from the airplane industry remain good.

Philadelphia—Plain carbon bars are moving slowly. A slackening also is noted in cold-drawn and alloy bars, following fairly good demand recently.

Birmingham, Ala.—Concrete reinforcing bars constitute the major portion of bar business. Considerable slackening has been evident in other specifications, but production is at 50 per cent or better.

Buffalo—Bar production is lower on a marked shrinkage in automotive orders. Mills rolling reinforcing bars are slightly more active.

Pipe

Pipe Prices, Page 73

Cleveland—Merchant steel pipe is moving steadily to jobbers, influenced by like shipments from distributors' stocks. While deliveries show little change since a month ago, recent improvement in building activity will be reflected in consumption shortly. Jobbers' stocks are relatively moderate. The line pipe market is devoid of large tonnages scheduled for early closing.

Chicago—This city will close bids April 25 on 1478 tons of 12-inch and 300 tons of 16-inch cast pipe and 138

tons of fittings. Chicago also is in the market for 1500 fire hydrants, bids April 27.

New York — Merchant pipe demand still lags, but action is pending on a substantial tonnage for various buildings now under contract, and heavier orders are in prospect. Resale prices are not strong but are steadier than they were early this year.

Birmingham, Ala. — Inquiries are are more numerous with some increase in tonnage booked, with production on a five-day basis in most instances.

Seattle—The market lacks important inquiries. Several cities are awaiting allocation of federal funds. Bellingham, Wash. opened bids April 24 for an unstated tonnage of cast iron. Bids are in at Fort Lewis, Wash., for 200 tons of 8 to 12-inch and Kettle Falls, Wash., has opened tenders for 125 tons of 4 to 7-inch. District 17, Seattle, awarded 115 tons of 4 to 8-inch to transite.

San Francisco — Pending cast iron pipe business totals over 2000 tons. Awards are expected shortly on 368 tons for Mesa, Ariz., over 1000 tons for Oceanside, Calif., the general contract for which has already been placed, and on 303 tons for the national park service, Boulder City, Nev. So far this year 6670 tons have been booked, compared with 9101 tons a year ago.

Cast Pipe Pending

1778 tons, Chicago, including 1478 tons of 12-inch, 300 tons of 16-inch; also 138 tons of offset bends for 6, 8 and 12-inch pipe. Bids April 25.

1000 to 1400 tons, 12 to 18-inch, Oceanside, Calif.; general contract awarded and sub-contract for cast iron pipe expected to be awarded soon to United States Pipe & Foundry Co., Burlington, N. J.

Unstated tonnage, cast iron, transite or wood stave pipe, 12,000 feet of 4 to 16-inch, Seaside, Oreg.; bids April 28.

Wire

Wire Prices, Page 73

Cleveland—Wire orders hold below the rate a month ago, while shipments also have moderated, although less sharply. Merchant products make a relatively better showing than manufacturers' wire despite the retarding influence of unfavorable weather on buying of the former in rural districts. Nail consumption reflects marked gains in building compared with a year ago.

New York—Wire buying is slack and barely maintained at the recent slow rate, although well diversified. Consumption has declined and buying in small lots for prompt delivery makes up most current business. Operations in the East are not much above 50 per cent.

Birmingham, Ala. — Demand for wire products continues steady, second only to sheets. Mills estimate output of wire at something above 60 per cent with an indicated steady demand.

Rails, Cars

Track Material Prices, Page 73

Placing of some 15,000 tons of steel for 1150 cars recently placed by Missouri Pacific is expected shortly, most probably going to western mills. Considerable tonnage will be required for locomotives for the same road.

No award has been made on material for 1000 gondolas to be built by Illinois Central and Denver & Rio Grande Western has not awarded 600 cars on which bids have been opened.

Revival of an inquiry by the Central of Brazil for 1000 freight cars and 25 steam locomotives, bids to be opened May 15 in Rio de Janeiro, is important to American builders. It had been thought the business would go to German builders when the inquiry was first made. Present specifications call for many American specialties. The cars include 450 box cars, 300 flats and 250 gondolas.

Maine Central has awarded 300 box cars to Magor Car Corp., Passaic, N. J., 300 gondolas remaining to be placed.

Car Orders Placed

Maine Central, 300 box cars, to Magor Car Corp., Passaic, N. J.; 300 gondolas, still pending.

Wabash, 35 cabooses, to own shops.

Car Orders Pending

Central of Brazil, 1000 freight cars; inquiry revived, through Waldemar Coimbra Luz, general manager, Praca da Republica, Rio de Janeiro; bids about May 15.

Union Tank Car Co., 10 to 30 tank cars; bids asked.

Union railroad, 10 steel caboose cars; bids asked.

Rail Orders Placed

Erie, 15,167 tons; Carnegie-Illinois Steel Corp., Pittsburgh, 12,135 tons, Bethlehem Steel Co., Bethlehem, Pa., 1972 tons, Inland Steel Co., Chicago, 1060 tons; total rail and fastenings program for 1939 calls for about 30,000 tons.

Nickel Plate, 2400 tons 112-pound rails; 1560 tons to Carnegie-Illinois Steel Corp., Pittsburgh, 440 tons to Inland Steel Co., Chicago, 400 to... lehem Steel Co., Bethlehem...

Locomotives Pending

Central of Brazil, 25 steam l... eight of 2-10-4 type and 1... this or 2-10-2 type; bids ab... by Waldemar Coimbra L... manager, Praca da Republ... Janeiro.

Buses Booked

American Car & Foundry Co., ... Fifteen 36-passenger and ... senger for Boston Elevate... Boston; ten 37-passenger ... eastern Greyhound Lines, ... Ky.; four 39-passenger for ... Transit Co., Scranton, Pa.; ... passenger for Virginia Electri... Co., Richmond, Va.; three 41-... for Jamaica Buses Inc., Jama... two 35-passenger for Edwa... Transit Co. Inc., William... one 36-passenger for San Die... Railway Co.; one 36-passenge... liamsport Transportation Co.... port, Pa.; one 40-passenger ... Worcester & New York Stree... Co., Framingham, Mass.; on... senger for Quaker City Bus ... Ocean City, N. J.; six for ... Transportation Co., Lancaster... for Vermont Transit Co., Burli...

Twin Coach Co., Kent, O.: Tw... passenger for Tulsa City L... Tulsa, Okla; twenty 27-passe... Rochester Transit Co., Roches... ten 23-passenger for Winnipe... Co., Winnipeg, Man.; eight 31-... for Valley Motor Transit ... Liverpool, O.; five 35-passe... Dallas Railway & Terminal ... las, Tex.; four 32-passenger ... Orleans Public Service Co., ... leans; two 41-passenger for ... Portland Bus Co., Portland, O... 31-passenger for Co-operative ... Co., Wheeling, W. Va.

Buses Pending

San Francisco Municipal Railw... to 12 trolley coaches; bids ask...

Shapes

Structural Shape Prices, Pag...

Pittsburgh — Structural t... remain steady. Continuation ... nages on government proj... well as initial inquiries on n... continue to hold up well a... outlook remains good.

Cleveland — Public award... tinue to bolster the market. ... vate work is light. Some t... from the latter source has ... oped, limited to lots well un... tons. Outstanding recent aw... volving 3750 tons for the East ... ty-first bridge, Lorain, O., w... American Bridge Co., Pitts... Fabricated prices remain wea...

Chicago—Tonnage is well ... tained, and is one of the br... spots in the present market...

—*e Market Week*—

activities have tended up- are exerting a stronger A bridge-building program Wisconsin, involving ap- ely 1000 tons; bids due

ork—Award of 6500 tons, tructural tunnel supports, pending needs for the Dela- educt. Bridge needs are usive of 1000 tons for New ighway work, bids being

lphia—Awards include a involving 1200 tons for a or control board, Harris- Bethlehem Steel Co., Beth- Approximately 750 tons are for a bridge; bids April 28 ennsylvania turnpike com- Bedford county.

— Pending tonnage is swelling to the largest vol- several years. The encour- pect of the present struc- rket is the increased num- ivate jobs scattered among erous government financed Most recent of the private he new $2,000,000 combina- rehouse and factory to be e this year by General Mills,

e—Business pending is of al proportions and no siz- nages are out for figures. er plants have a fair back- prospects for the current are not reassuring.

Francisco — Awards totaled s and brought the aggregate year to 45,626 tons, com- ith 37,828 tons in 1938. Bids st been taken on 1700 tons ridge over the Sacramento d on 800 tons for the Doney ridge on the Central Valley Calif.

ngham, Ala. — Some fair nnage of shapes is still pend- hough most business is in ots. Prominent among re- ntracts was 3000 tons for an Celanese Corp., to Vir- ridge Co., affiliate of Tennes- l, Iron & Railroad Co.

e Awards Compared

	Tons
nded April 22	26,316
ended April 15	36,266
ended April 8	15,805
eek, 1938	25,971
y average, year, 1938	21,566
y average, 1939	25,575
y average, March	21,240
to date, 1938	268,705
o date, 1939	383,629

les awards of 100 tons or more.

Shape Contracts Placed

6700 tons, contract 318, Delaware aqueduct, New York, tunnel ribs and miscellaneous material, to Carnegie-Illinois Steel Corp., Pittsburgh; through Pleasantville Cantrracting Co., New York.

3750 tons, superstructure, East Twenty-first street bridge, Lorain, O., to American Bridge Co.. Pittsburgh.

2100 tons, building, state liquor control board, Harrisburg, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

1200 tons, grade crossing, Queens, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; through National Excavation Co., New York.

1120 tons, East river drive, contract 6, New York, to American Bridge Co., Pittsburgh.

950 tons, bridge, FAGM-497, Dallam county, Texas, to Capitol Steel & Iron Co.

800 tons, pumping station, Chicago, for city, to Joseph T. Ryerson & Son, Inc., Chicago.

700 tons, viaduct, South Laramie avenue, Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

675 tons, state highway bridge, Tipton, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

665 tons, garage and storehouse, Medical center, Jersey City, N. J., to F. G. Schaefer Iron Works, Edgewater, N. J.

550 tons, water and power plant building, Owensboro, Ky., to American Bridge Co., Pittsburgh.

510 tons, addition to Bowem building, Washington, to Lehigh Structural Steel Co., Bethlehem, Pa.

400 tons, high school, Newark, Bethlehem Steel Co., Buffalo.

365 tons, senior high school, W... N. J., to Oltmer Iron Wor... City, N. J.

350 tons, hangar for air port, Calif., to Independent Ir... Oakland, Calif.

330 tons, viaduct, Jefferson co... bury, Neb., to Fort Pitt Bri... Pittsburgh.

331 tons, specification 836, ga... ery for Coulee dam, to ... Bridge Co.

315 tons, school, Chagrin Fa... Ingalls Iron Works Co., Bi... Ala.; through Gilmore, Carr... Olson Co., Cleveland.

300 tons, eleven traveling cran... for Bremerton navy yard, on... Diego and two for Mare Isl... yard, to Cyclops Iron Wo... Francisco.

285 tons, high school, Austin, ... American Bridge Co., Pittsbu...

270 tons, Wrightwood avenu... structure, Chicago, to ... Bridge & Iron Co., Milwaukee.

255 tons, building and alter... building, for Draper Corp., ... Mass., to American Bridge C... burgh.

250 tons, buildings between ha... hangars, North Beach airpo... York, for treasury departm... Bethlehem Steel Co., Bethle...

240 tons, state bridge, Park str... nington, Vt., to Bethlehem S... Bethlehem, Pa.

240 tons, addition, Jelleff store, W... ton, to Barber & Ross, Washing...

230 tons, bridge, ERP-10, M... county, Texas, to Central Tex... Works, Waco, Tex.

215 tons, bridge 237-D, Missoula ... Montana, to J. B. Klein ... Foundry Co., Oklahoma City. ...

200 tons, St. Mary's hospital, Sa... cisco, to Judson-Pacific Co., Sa... cisco.

195 tons, bridge 535, Harris, N... Virginia Bridge Co., Roanoke, ...

195 tons, bridge, WPSS-1153-B2, ... Va., to Virginia Bridge Co., ... Va.

180 tons, extensions to buildi... Lever Bros. Co., Edgewater, N... Bethlehem Fabricators Inc., Bet... Pa.

180 tons, Chippeway street underp... Louis, to the Mississippi Valley ... tural Co., Decatur, Ill. Erroneo... ported as placed with Stupp... Bridge & Iron Co., St. Louis.

180 tons, school, Kent, Conn., to ... Construction Co., Berlin, Conn.

175 tons, Central school, Andover, ... to R. S. McMannus Steel Const... Co. Inc., Buffalo.

160 tons, shop and laboratory bu... Pittsburgh, to Keystone Engineeri... Pittsburgh.

160 tons, surgical building, M... center, Jersey City, N. J., to ... Schaefer Iron Works, Edgewater.

150 tons, school, Cortland, N. Y., to ... con Steel Co., Buffalo.

145 tons, Michael Manos theater, ... nette, Pa., to Pittsburgh Bri... Iron Works, Pittsburgh.

125 tons, incinerator, Cambridge, ... to West End Iron Works, Cam...

120 tons, Woodworth store buildin... waukee, to American Bridge Co.... burgh.

118 tons, bridges for Alaska road ... mission, to Worden-Allen Co.... waukee.

r bridges, Alaska Railroad Seattle, for erection in Worden-Allen Co., Mil-

pe fittings and appurte- Coulee dam, to Associated ngineering Co., Los Angeles.

ectric overhead crane for d navy yard, to Harnisch- Milwaukee.

ontracts Pending

lternate 135 tons, Ballard , Seattle; bids May 4.

ichigan state board of agri- eld house and gymnasium, ng, Mich.; bids May 1.

bridges, scattered locations, sconsin; bids April 25.

ore building, for Montgom- & Co., Detroit.

tension to power house, for Michigan Electric Co., Mish- d.

ennsylvania turnpike com- edford county; bids April 28.

ditions, Leech Farm hospital, for city.

te bridges, Grafton, Vt.

plant alterations, American rp., Nitro, W. Va.

tate bridges, Marlboro and Vt.

tate bridges, Guilford and t.

ewer tunnel lining, Detroit.

nnel supports, three tunnels, alley project, Calif.; bids der specification 839.

ureau of reclamation, fish Leavenworth, Wash.; bids

building, for International Co., Long Island City, N. Y.

Vashington state Cedar river avid Nygren, Seattle, gen- ractor.

ate bridges, Bridgewater and Vt.

Remsen avenue bridge, Los for state; bids May 10.

aculty assembly building, for versity, Columbus, O.

under-pass, central valley alif., near Shasta dam; Beth- eel Co., Bethlehem, Pa., low.

8 overhead garage and shop ids at Fort Lewis, Wash.,

onnage, contract S-4A, tunnel icago river crossing for State ubway; Merritt-Chapman & rp., New York, contractor.

uts, Rivets

ut, Rivet Prices, Page 73

ed improvement in bolt, rivet business so far this s been below expectations, ecause of downward revi- automotive needs. Rail- ing also is developing more an was looked for, although ages are being shipped and l new business is in pros- ove and farm implement urers are specifying stead- er demand is quiet.

Reinforcing

Reinforcing Bar Prices, Page 73

Chicago — The market looks brighter with several new tonnages of substantial size up for bidding, and numerous projects in the offing. Largest pending tonnage is in another section of the Chicago subway program, involving 3500 tons, bids May 4.

Pittsburgh—Inquiries continue to appear in fair volume and placements are heavier. Prices have been fair with most sections reporting little deviation from former reported prices. Most of the newly announced jobs are public projects, the largest involving 650 tons for the Bedford housing project, Pittsburgh.

Cleveland — Private work is restricted to small lots, although a slight improvement in number of jobs has been noted. Galier Bros. Co., Cleveland, recently awarded 300 tons for the Mill Run storm sewer, Steubenville, O., to Carnegie-Illinois

Steel Corp., Pittsburgh. Prices show no signs of stiffening from the low levels of the past few months.

Philadelphia—Awards include 310 tons for the Jefferson memorial, Washington, D. C., to Bethlehem Steel Co., Bethlehem, Pa. Plans for the Nazareth hospital, Philadelphia are to be revised, although McCloskey & Co., Philadelphia, will handle construction as general contractors.

Seattle—Announcement is awaited regarding award of general cantract for the Seattle federal courthouse involving 1700 tons of reinforcing. Specifications for the Ballard bridge, Seattle, bids May 4, call for 1835 tons reinforcing under one schedule and 750 tons under a second. No other important business has developed.

St. Louis — Laclede Steel Co. booked 241 tons for two public schools, Davenport, Ia. Otherwise awards consist of small lots, aggregating under 300 tons, and little is pending. Improvement is looked for next month, when a number of road programs will develop.

San Francisco—The outlook is encouraging and a numb projects have appeared f ing for a fairly heavy Pending business now e 000 tons. Awards aggr tons bringing the total 60,618 tons, compared tons a year ago.

Reinforcing Steel A

500 tons, water and light pl boro, Ky., to Laclede St Louis, through Engstrom Wheeling, W. Va., contrac

463 tons, sections 8C and 9 vania turnpike, Somerset Jones & Laughlin Steel burgh; through County Co., Carnegie, Pa., contract

320 tons, hospital administra ing, Vauclain Home, San Di California, to unnamed int

310 tons, Jefferson memorial ton, to Bethlehem Steel Co., Pa.; through John McShane delphia.

300 tons, mill run storm sew ville, O., to Carnegie-Illinois Pittsburgh; through Galler Cleveland.

300 tons, Thomas Jefferson Washington, to Bethlehem Bethlehem, Pa.; John McS tractor.

241 tons, two public schools, Iowa, to Laclede Steel Co.,

240 tons, viaduct, Sixth st cinnati, to West Virginia Huntington, W. Va.; throug Conway Co., Cincinnati, con

200 tons, grade school, Hambu to Bethlehem Steel Co., Pa.; through Border Pu contractor.

200 tons, rayon mill, Celan Narrows, Va., to Bethlehem Bethlehem, Pa.; through Foulkrod, Philadelphia, con

200 tons, high school, Newa to Joseph T. Ryerson & Buffalo.

199 tons, two over-crossings mona, Los Angeles county, for state, to unnamed interes

158 tons, super-structure shop, naval base, Alameda, West Slope Steel Co., Santa Calif.

145 tons, invitation 4/7942, pr division, U. S. treasury, Cin to Republic Steel Corp., through Patterson-Leitch, Cle

140 tons, Lake street viaduct nection with Golden Gate br

Concrete Bars Compo

Week ended April 22	
Week ended April 15	
Week ended April 8	
This week, 1938	
Weekly average, year, 193	
Weekly average, 1939	
Weekly average, March	
Total to date, 1938	
Total to date, 1939	

Includes awards of 100 tons

to Gunn, Carle & Co., San

bridges over Coyote Creek, ra county, California, for an Jose Steel Co., San Jose,

bridges, Sacramento county, for county, to Truscon San Francisco.

vo bridges and road, Lin- I., to Bethlehem Steel Co., Pa.; through Bancroft-

ross island parkway, con- 39-4, Queens county, New Bethlehem Steel Co., Beth- ; through Border Building ector.

morial hospital, Rome, N. Y., tic Steel Corp., Cleveland, Truscon Steel Co., Youngs-

ing Steel Pending

hicago subway section; bids

United States engineer of- Angeles, proposal 210; Co- eel Co., San Francisco, low.

alternate 750 tons) Ballard attle; bids to board of pub- May 4.

0-man army barracks super- Chanute field, Rantoul, Ill.; 21.

Bedford housing project. ; Mellon-Stuart Co., Pitts- w bidder.

ison, Green Haven, N. Y.

aduct, Fifteenth street, Kan- Mo.

estern Regional Laboratory, nt of Agriculture, Albany, s May 26.

der-pass, Phoenix, Ariz., for s May 16.

ant addition, Flexible Shaft go; bids in.

ard of education, south side school, superstructure, Chi- dding April 25.

ch bridges, Bedford county, nia; bids April 28 to Penn- urnpike commission.

building, Montgomery Ward etroit.

ymnasium and field house, sing, Mich.

shore parkway, contract Brooklyn, N. Y.

idge, Shoshone county, Idaho; ed.

rankfort, Ky., state highway Ralph Rogers, Bloomington, eral contractor.

ewer, University City, Mo.; 1 19.

bridges, scattered locations, Wisconsin; bids April 25.

requisition 1006-ER, Norfolk d, Portsmouth, Va.

highway work, Arapahoe olorado; bids April 25.

tore addition, Sears, Roebuck uffalo; Siegfried Construction do, low.

ghway work Alameda county, a; Dan Caputo, San Jose, w.

school, district 6, Davenport, ls in

nnage, 8-story telephone com- ding, Springfield, Ill.

undercrossing, Bend, Oreg.; 11.

Pig Iron

Pig Iron Prices, Page 74

Cleveland — Pig iron deliveries continue about 10 per cent slower than a month ago. Foundry coke demand makes a more favorable comparison, but demand lately has been stimulated by some orders in anticipation of a possible shortage. No coke scarcity is imminent here, leading producers having an adequate coal supply for operations at least through May, in addition to coke stocks on hand at ovens.

Chicago—Shipments are off about 10 per cent compared with the same period in March. Sellers believe the month will show this rate, although earlier in April only a 3 to 5 per cent decline had been estimated. Sales are very spotty, orders being few and for small lots only. By-product foundry coke shipments are reported about on a par with last month.

New York—Pig iron demand is spotty, reflecting a similar condition in foundry operations. Makers of

Behind the Scenes with STEEL

Getting Us Down

■ That fellow staring at you with those empty sockets on page 28 will give you a rough idea of how we feel today after the umteenth straight day of rain and cold weather. We've had our golf clubs all cleaned and rewrapped for weeks, the summer suit was even sent to the cleaners and one afternoon a few days ago when the sun snuck out for just a minute we even toyed with the idea of breaking out those new brown and white sport shoes we picked up last fall on sale. And today, to top it off, we sit here looking glumly across through a drizzling rain at the lake-front stadium where over 30,000 grandmothers' funerals are supposed to be held this afternoon as the Cleveland Indians open their home season. If all this keeps up much longer we're really going to do something about it, Mark Twain notwithstanding.

War Clouds

■ Along with everyone else, we've been pretty worried about the possibility of war but so far we haven't let it get us quite as much as Reader W. R. France up in Minneapolis. He sends along his check for one more year of STEEL with a note saying: "If I'm not in the army (by request) when the renewal comes due again I'll take advantage of your two year subscription rate." Well, we may be wrong but we're still betting there'll be no war this year or next.

Where Is It?

■ Most interesting new subscriber last week was, by coincidence, also named France—J. H. France Refractories Co., at *Snow Shoe*, Pa. Ever been there?

New Paper

■ With appropriate fan-fare there appeared last week on the office scene here a really attractive new house magazine which is going to be a regular affair from now on. *Penton Progress* is devoted exclusively to company activities and behind the scenes stuff on some of our more flashing personalities. It is scheduled for once a month, will be edited by a constantly changing committee and is, we think, a swell idea for every company to have. If you're interested in something similar for your own organization, we can probably sneak you a sample.

Air Minded

■ The real test of a good trade paper, we think, is its ability to keep just a step ahead of its industry's progress. STEEL has done this in years past and is again doing it with a more complete coverage of aircraft manufacture as that industry really comes of age. This week on page 40 is another swell article with a lot of meat in it.

Engineers Note

■ For some months now the new Main Avenue bridge across the Cuyahoga river has been the pet avocation of hundreds of us who pass it each day on the way to work. With the typical enthusiasm of the ordinary sidewalk superintendent we have slowed down our jalopie every morning and evening to inspect things as the structural steel work moved along from span to span, with stanchions supporting each one until the spread was made. They're all complete except the river span and every day now we get asked how they're going to shove that steel work right across the river without any supports. Well, we don't pretend to be an engineer and although we are fairly sure we've got the answer we can't just exactly say it outloud. Some one of you engineers must have an easy, quick explanation that we can use and if you'll send it in right away we'll buy you our usual short beer.

SHRDLU

soil pipe and building hard
some machine tool foun
fairly busy, but jobbing p
doing no better than a m
Export buying is quiet. C
are unchanged despite lig
plies resulting from the
strike. Some coal buyers
forced to turn to retail
truck loads instead of
wholesale carlots.

Philadelphia—Pig iron
is confined to small orders.
melt smaller than a mo
Shipments also are slower.

Buffalo—Producers hav
large orders on books, but
are slow. Shipments this
date are a trifle under th
rate. Movement to eastern
is expected to expand sh
navigation on the barge ca
under way. Foundry o
vary, schedules of genera
facturers being fairly steac
plants working on governm
ders are busy. Automotive
has contracted.

Cincinnati — Shipments
least 10 per cent below th
rate, with no immediate up
dicated. Machine tools con
provide the best demand
ings. New buying of iron
fined to small spot order
specifications show little e
coal mining suspensions.

St. Louis—New buying i
the only sale reported being
500 tons to a specialty make
ments have declined gradu
far this month, accompan
similar trend in the melt
mills and foundries. Const
is well ahead of the rate
ago. Both stove and jobbin
ries are working three to fo
a week. Foundry stocks a
and will need additions soon.

Birmingham, Ala. — Due
creased open hearth operatio
iron production shows furt
trenchment.

Toronto, Ont.—Sales contin
low the year's average
heavier than two or three
ago. Business is entirely in
lots. More extensive buy
looked for with the openi
Great Lakes navigation. Pi
production is unchanged, with
stacks blowing.

Seattle—Business is quiet
iron foundries, steel plants
ing spotty operations, but a
average volume. Consumpt
iron is below seasonal levels.
Burn iron is being importe
ing at the same price as Col
with the latter giving more
tive delivery. British coke
changed at $17 c.i.f.

ap

rap Prices, Page 76

gh—Scrap is weaker, with nactive and most prices A few distress cars of el are reported to have 15, but in the absence of es it is difficult to quote ices. Supplies of railroad restricted by refusal of s to dispose of recent lists f low bids.

d—Recent sales at current e been small and mostly e shipment. Restrictions nt in the Youngstown dis- till in force. Some steel- rades have been marked ents, No. 1 heavy melting being quoted at $13.50 to o. 2 at $12.50 to $13.

—The market is fairly ac- result of coverage on re- purchases. In addition to f a large tonnage of steel- crap to a leading consum- mills have bought smaller rious grades. No. 1 steel $12.50 to $13, while a few nts have been made on ns.

lphia—Prices are easier in f important domestic buy- several grades nominally o. 1 steel now is $15.50 and $13.50. Export buying con- supporting factor, several aving left here this month more being loaded.

— Pressure continues on ough absence of sales and in other markets. No. 1 nchanged at $13.50 to $14, paying the top figure for aterial. Large buyers at Falls have withdrawn bids iron borings are down to 7.25.

— Scrap prices are down on continued absence of buying and a decline in ion. Quotations on prac- grades are off 25 cents to

ati — Dealer quotations down 25 to 50 cents, while s are slower. With the ncertain, dealers are inac- uying, although yard stocks nusually large.

is—Undertone of the mar- t, with demand dull. Weak- most pronounced in heavy steel and cast grades. Sales iries are scant, but inven- some mills have been cur- d renewed buying is looked Offerings are light.

gham, Ala. — Except for 1 cast for foundry use and demand for stove plate from blast furnaces, there is little activity in scrap. Prices are nominally lower.

Seattle—Orders from Japan are regulated by budget and import regulation. Some business is coming from that source with export price for No. 1 melting firm at $14.50. Tidewater supplies are ample for demand, but foreign commitments have mostly been forwarded. Rolling mills are buying as needs dictate at $10 to $12, according to quality.

Toronto, Ont. — Demand is more active but confined principally to heavy melting steel, machinery cast and stove plate. Offerings are heavier, yard receipts of dealers being ahead of shipments. Prices are firm and unchanged.

Chrome Ore Imported

Philadelphia — Substantial shipments of chrome ore were received here during the week ended April 15, 2839 tons from Cuba and 1000 tons from the Philippines.

Also received were 350 tons of ferromanganese from Poland and 149 tons of sponge iron, 52 tons of

steel tubes and five tons of steel bars, all from Sweden.

Baltimore—Seven shipments of iron ore were received here during the period from April 5 to April 14: 6086 tons April 5 from Narvik, Sweden; 2000 tons of chrome bearing iron ore from Manisloc April 9; April 11, 21,500 tons from Cruz Grande, Chile, 7196 tons from Narvik, and 10,500 tons from Daiquiri, Cuba; April 13, 22,300 tons from Cruz Grande.

Other arrivals in that period included 8180 tons of ilmenite sand and 150 tons of monasite sand, April 5 and 1500 tons of manganese ore from Calcutta, April 11.

Warehouse

Warehouse Prices, Page 75

Cleveland — Orders occasionally are heavier but disclose no definite trend, and variations from the March rate are small. The month to date is somewhat below expectations.

Chicago—Demand is slightly heavier, following a dip the middle of the month. April is thought likely to top March by a small margin. Orders are extremely small but are well distributed as to consumers.

Boston — Warehouse volume has failed to improve, the usual spring upturn being less than normal. While demand is well diversified and the number of orders numerous, total tonnage is slack, notably in heavier goods.

Philadelphia — Demand continues to taper, with a substantial drop indicated for this month compared with March, peak for the year to date. Resale prices are steady except in pipe.

Buffalo—Sales so far in April are close to the volume a month ago. Orders are small and only for immediate needs.

Cincinnati—Business is steady on frequent ordering for industrial needs. Coal mining inactivity is without effect on sales, previously having been slow. Prices are steadier.

St. Louis—Dullness in warehouse business has been intensified by unfavorable weather, and April is expected to show a decrease of about 8 per cent from the relatively small March volume. Oil country goods continue active, but building products demand is slow to expand.

Seattle—For the first time in several years, prices in the Seattle area have broken, plates, shapes, bars and floor plates being down 65 cents and galvanized sheets 50 cents. Conditions in general are unsatisfactory. At Portland, dealers are more closely adhering to price schedules.

Steel in Eur

Foreign Steel Prices, P

London — (*By Cable*
in Great Britain's steel
increasing steadily, own
ernment defense contra
certain international s
slowing normal business
tional blast furnace is b
service. Steel output is a
a record volume, partly
inadequate scrap suppli
cent shipping subsidy is s
domestic steel trade.

Imports in March w
tons, compared with 89,1
February; exports 167,917
with 137,520 tons.

Continental export tra
ing well under the circ
French domestic prices ar
to rise.

Iron Ore

Iron Ore Prices, Page

Cleveland—With ore
awaiting the opening of
sections of the route betw
Superior docks and lo
ports, the iron ore market
enlivened slightly by the a
of an inquiry from Ford
However, this involves only
grade, 24,000 tons of
ganese material.

Lake Superior iron ore
tion in March totaled
gross tons, compared with
tons in February. Compa
the 1,980,182 tons cons
March, 1938, a gain of 67.5
was shown. First quar
sumption of 9,095,937 tons
per cent larger than the
tons for the first three mo
year.

Stocks at furnaces and L
docks April 1 were about
tons smaller than a year
ures of the Lake Superior
association follow:

	Furnaces	Lake Erie docks
Apr. 1, 1939	21,054,249	4,817,875
Month Ago..	23,912,344	4,927,709
Year Ago...	29,736,080	5,487,221

New York—An order h
placed for several thousand
chrome ore by a large chem
terest. It will be shipp
South Africa. Chrome or
are steady. Tungsten ore i
ly easier at $19 to $19.50 p
ton unit, prepaid. Ferrotun
lower at $1.60 to $1.65 per
contained tungsten, carlo
tungsten metal powder for sh
ment in 200-pound drums
pound; in smaller lots, $2.1

Select Asbury 1939 Meeting

AN Electro-Platers so- old its annual convention Park, N. J., June 19-22, ewark branch officiating t. With the New York r to be in progress at the meeting is being s an international affair, s and discussions to be y chemists and platers putation.

pit will feature plating ing, metal cleaning, and electrical equipment; d chemicals; and a wide plated products.

hipments Increase

ts of iron, steel and other ver the three rivers in urgh district in March substantial gain compared in same month last year. ures:

on, Steel Products

	March 1939	Feb. 1939	March 1938
	3,200	4,700	1,850
	125,500	93,600	91,550
a	64,450	60,500	57,060

All Products

	199,300	134,750	151,269
	1,114,150	879,850	787,505
a	1,741,600	1,556,900	1,225,867

ncreased

CAN Radiator & Standard Corp.'s gross sales in the months this year were ent larger than the com- eriod last year. The in- March over March, 1938, ted at approximately 20 or the domestic operations e being no foreign reports.

Comments

cluded from Page 9)

niformly throughout the

cite another illustration, elephone. What did it ac- except to displace a great ls and force them to seek nt in an already glutted rket? Most certainly it is mprovement for the sub- nd rates have not been de- The subscriber does the the telephone company it for the privilege of doing

a typical example which long way to explode the hat the benefits of ma- re passed along to the con- his is true where competi- rong enough, as in the au- industry, but where there npetition it is not true.

I am very much interested in this matter and would be glad to have any suggestions you might have regarding steps which might be taken. I am satisfied that until we face the matter frankly no remedy will be forthcoming.

CHAS. I. FADDIS
Member of Congress,
Twenty-fifth district,
Pennsylvania.

Delta-Star Electric Co., Chicago, has been awarded contract approximating $95,000 for 287,000-volt three pole disconnecting switches by the California department of water and power, Los Angeles, for use on its new transmission line from Boulder dam to Los Angeles.

Ferroalloys

Ferroalloy Prices, Page 74

New York—Most ferroalloy prices are steady, with demand for ferromanganese and spiegeleisen reflecting the downward trend in steelmaking. Activity in other ferroalloys is spotty. Ferrotungsten has been reduced 5 cents a pound, with tungsten powder down similarly.

Equipment

Chicago—A drop-off in sales is reported for the past week. Orders are becoming scarcer, and inquiries have declined slightly in number.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound.

April	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
15	10.50	10.75	10.00	46.70	46.70	4.75	4.60	4.50	20.00	11.50	35.00
17	10.50	10.75	10.00	46.85	46.80	4.75	4.60	4.50	20.00	11.50	35.00
18	10.50	10.75	10.00	47.50	47.20	4.75	4.60	4.50	20.00	11.50	35.00
19	10.50	10.50	10.00	47.50	47.20	4.75	4.60	4.50	20.00	11.50	35.00
20	10.25	10.25	9.87½	47.50	47.20	4.75	4.60	4.50	20.00	11.50	35.00
21	10.00	10.25	9.62½	47.85	47.55	4.75	4.60	4.50	20.00	11.50	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb, except as specified. Copper brass products based on 10.25c Conn. copper

Sheets

Yellow brass (high) 16.65
Copper, hot rolled 18.37
Lead, cut to jobbers 8.00
Zinc, 100 lb. base 9.75

Tubes

High yellow brass 19.40
Seamless copper 18.87

Rods

High yellow brass 12.00
Copper, hot rolled 15.87

Anodes

Copper, untrimmed 15.62

Wire

Yellow brass (high) 16.90

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York 5.75-6.00
Cleveland 6.12½-6.37½
Chicago 6.12½-6.37½
St. Louis 6.00-6.25

Heavy Copper and Wire

New York, No. 1 .....7.62½-7.75
Cleveland, No. 1 .....7.62½-7.75
Chicago, No. 1 .....7.50-7.75
St. Louis 7.75-8.00

Composition Brass Borings

New York 5.00-5.25

Light Copper

New York 6.25-6.50
Cleveland 5.87½-6.00
Chicago 6.12½-6.37½
St. Louis 6.25-6.50

Light Brass

Cleveland 3.12½-3.37½
Chicago 3.87½-4.12½
St. Louis 3.37½-3.62½

Lead

New York 4.10-4.35
Cleveland 3.50-3.75
Chicago 3.50-3.75
St. Louis 3.50-3.75

Zinc

New York 2.50-2.62½
Cleveland 2.00-2.25
St. Louis 2.00-2.25

Aluminum

Borings, Cleveland 6.25-6.50
Mixed, cast, Cleveland 7.75-8.00
Clips, soft, Cleveland 14.75-15.00
Mixed cast, St. Louis 7.75-8.25

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads..10.25
Standard No. 12 aluminum....12.50-13.00

Sales of small tools a... normal, but heavy machin... moving well. Sales of ... chines are spotty, and li... demand for large machin... ported. Individual orders ... in size.

Seattle—Inquiry for m... road machinery is up to ... levels but salmon cann... ators are awaiting settlem... bor disputes before placin... ments. Bonneville Auth... called bids April 25 for ... bushing potential devices ... Vancouver substation, Ma... 289 outdoor buss insulato... 274, May 10 for 11 tons ca... mission line, Spec. 273. Ma... 12 potential transformers, S... Same office has awarded ... Electric at $15,390 for circu... ers for Hood River and K... stations.

Nonferrous Metals

New York — Nonferrou... markets were active last we... wise as copper producers ... quotations in an effort to est... level which would stimulate ... and as active buying lifted ti... to the highest levels since ... 1937. Lead strengthened ... tinued active buying while ... mained quiet.

Copper—Custom smelters ... prices to the basis of 10.0... necticut, for electrolytic, the ... level attained since July, 19... mary mine producers reduce ... to the basis of 10.25c, Con... Drawn and rolled products ... and bronze ingots, red met... and other allied products als... lower. Only moderate busin... done at the new levels.

Tin—Consumers bought ... here in an attempt to enlar... reserves in case of an inter... of shipments which would b... should a major war bre... Straits spot closed at 47.85c.

Lead—On several days pr... booked more than their d... takes, making it necessary fo... to dip deeply into their ... stocks. Prices held firm at ... East St. Louis.

Zinc—Although shipments ... tained a satisfactory pace w... vanized sheet operations incr... fresh demand remained light. ... western held unchanged at ... East St. Louis.

Antimony—Buying interes... dull with prices unchanged at ... New York, for American s... cases and nominally 14.00c, du... New York, for Chinese spot.

Construction and Enterp

Ohio

CLEVELAND—Chilcote Co., A. J. Chilcote, president, has plans for a one-story, 50 x 150-foot addition costing $40,000. H. E. Shimmin, Cleveland, architect.

COLLEGE CORNER, O.—Village, John D. Pults, mayor, is completing plans for waterworks costing $67,244. Consultant, Rial T. Parrish, Dayton, O. (Noted Jan. 23.)

FOSTORIA, O.—National Carbon Co., C. J. Koster, works engineer, will soon award contracts for a two-story, 60 x 120-foot laboratory costing $60,000.

GREEN SPRINGS, O.—Village, Ira Young, mayor, is taking bids due at noon, May 4, on contracts 2, 3 and 4 for water softening plant and force mains, cost estimated at $45,000. Bond or certified check 5 per cent to accompany bid. Consulting engineer, Floyd G. Browne, Marion, O. (Noted April 17.)

MONTPELIER, O. — Village, J. M. Hoover, superintendent of utilities, has extended to noon, May 2, closing date on bids for contract 2 for construction of a filtration and water softening plant costing total of $75,000. Bond or certified check 5 per cent to accompany bids. Consulting engineer, H. P. Jones Co., Toledo, O. (Noted April 10.)

MT. GILEAD, O.—Village, James Bennett, mayor, proposes to construct a water softening plant.

NORWALK, O.—City, Fred P. Link, mayor, plans to install new boiler in its light plant and new smokestack, costing total of about $100,000. William C. Saladin, city service director, in charge.

PORT CLINTON, O.—Village, Fred W. Slauterbeck, mayor, is making surveys for contemplated construction of a sanitary system and sewage disposal plant. Champe, Finkbeiner & Associates, Toledo, O., consulting engineers.

SOUTH BOULEVARDS, O.—Village, Ray Clark, agent, is just incorporated and proposes to construct a sewer system and sewage treatment plant costing $75,000. Application filed for WPA funds; will issue bonds.

Connecticut

DANBURY, CONN.—Danbury Industrial Corp. soon will let contracts for a two-story, 100 x 200-foot factory costing about $100,000. E. B. Watson, Danbury, architect.

NEW LONDON, CONN.—City, T. Fitch, purchasing agent, is taking bids to April 28 for sewage pumping stations, force mains and various appurtenances. Solomon & Keis, Troy, N. Y., consulting engineers.

Massachusetts

DANVERS, MASS.—Town water department has plans for a filtration plant at Middletown Pond at cost of $145,000. PWA funds have been allotted.

New York

JAMESTOWN, N. Y.—Marlin-Rockwell Corp. will receive bids for two plant additions, 25 x 150 feet, and 25 x 170 feet, costing $40,000. Beck & Tinkham, Jamestown, engineers.

MADISON BARRACKS, N. Y.—Army construction quartermaster is accepting bids until April 26 for a water filtration plant costing approximately $65,000.

NEW YORK—Anderson Sheet Metal & Iron Works Inc. has been or capital of $10,000 to deal in and iron products. Re: Weisman, Celler, Quinn, A 1450 Broadway, New York.

New Jersey

EDGEWATER, N. J.— Cambridge, Mass., plan to b costing $1,000,000 with equi & Webster Engineering Co., sulting engineer.

Michigan

ADRIAN, MICH.—Southea gan Rural Electric Co-opera soon be ready for bids for a of rural electric power lines 000. C. C. Nye, Adrian, co gineer. (Noted Jan. 16.)

PONTIAC, MICH.—City, H clerk, is receiving bids unt May 5, on contract 3 for in to its sewage plant costing $5 ect involves repairs, instal pumps, chlorinating equipme tary distributors. H. P. Jon ledo, O., consultant.

Indiana

MARION, IND.—City, Ro clerk, is accepting bids to 9. 4, on construction of intercep and a sewage treatment pl $385,000. This is final con $600,000 PWA project. Cons send & Quinlan, Chicago, con gineers. (Noted Jan. 9.)

WARSAW, IND.—Warsaw F William Petro, president, is c and will equip a new foundr two stories, 68 x 90 feet.

Alabama

BESSEMER, ALA.—City ha $143,000 federal funds for c of a municipal electric distri tem.

Maryland

EASTON, MD.—Town, F. H son, mayor, receives bids installing electrical equipme ing 18,000-volt high potenti set, oil circuit breakers, s parts, transformers etc. Contr E. G. Kastenhuber Jr., town e

District of Columbia

WASHINGTON — Navy d yards and docks, takes bids for one 40-ton and two 15-t traveling jib cranes for Charles navy yard. Specification 9121.

WASHINGTON—Navy depart reau of supplies and account ceive bids until 10 a. m., May 2, driven bench lathes (schedule 6 electrical lathes (schedule 608 hack saw (schedule 6090); an and parts (schedule 6093); diese and parts (schedule 6097); heavy-duty riveting hammers 6103).

Kentucky

BURKESVILLE, KY.—City co plans in progress for a municipa power plant, with diesel engine ing units. Cost estimated at J. Stephen Watkins, Lexington, sulting engineer.

PADUCAH, KY.—Jackson Rural Electric Co-operative Co Harris, superintendent, has $184,000 REA allotment for 1

Economy-minded buyers of made-to-order screws and headed parts are discovering real savings in PROGRESSIVE cold upset products. They have found that many parts now milled from the bar can be headed efficiently and accurately with our modern equipment — at reduced costs. We invite you to submit samples or outline ideas to our specialists. Their advice — intelligently and promptly given — may show you the way to greater fastening economies.

PROGRESSIVE MFG. CO.
CONNECTICUT

Serving American Industry Since 1884 — Overhead Electric Cranes and Hoists Crawler Cranes • Electric Motors • Arc Welders • Welding Electrodes.
Harnischfeger Corporation
4411 W. National Ave., Milwaukee, Wis.

LOCOMOTIVE CRANES
CRAWLER CRANES
SHOVELS
OHIO
OHIO LOCOMOTIVE CRANE CO.

ranteed
plus in
ium
ride
to exceed
silica
ulk

HILLSIDE FLUOR SPAR ROSICLARE

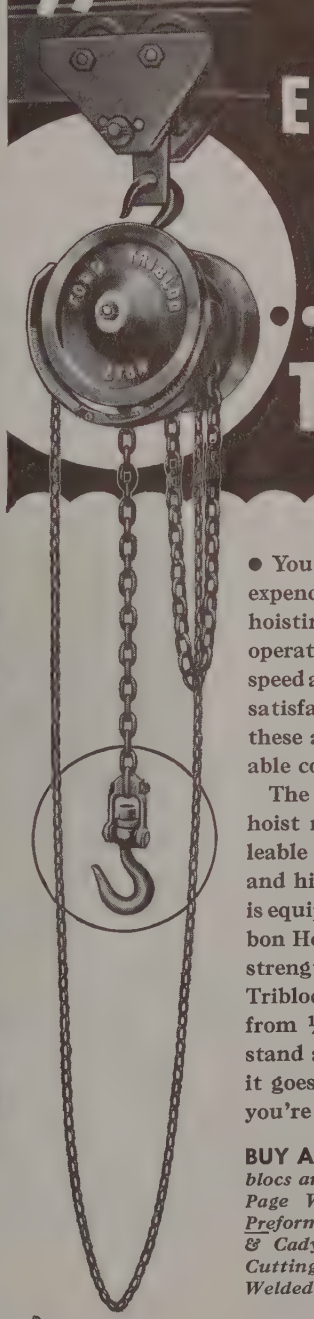
Barges 500 tons Ohio River from our river loading station at Rosiclare.

shipments from Rosiclare on Ill. Cent. RR

WASHED GRAVEL

LLSIDE FLUOR SPAR MINES
Phone: Ran. 1151
o. Dearborn St. Chicago, Illinois

Here's Speed and ECONOMY . . FORD TRIBLOCS



● You don't have to go in for heavy expenditures to speed up many hoisting and material handling operations. Ford Triblocs give you speed and every assurance of long, satisfactory service—and give you these advantages at very reasonable cost.

The Ford Tribloc is a spur-gear hoist made throughout of malleable castings of certified grade and high grade drop forgings. It is equipped with ACCO High Carbon Heat Treated Chain of great strength and high elastic limit. Triblocs are made for capacities from ¼ to 40 tons. Each must stand a 50% overload test before it goes to you. When you get it you're sure of it.

BUY ACCO QUALITY *in Ford Triblocs and other Ford Hoists—and in Page Welding Electrodes, Lay-Set Preformed Wire Rope, Reading-Pratt & Cady Valves, Campbell Abrasive Cutting Machines and American Welded and Weldless Chains.*

FORD CHAIN BLOCK DIVISION
PHILADELPHIA, PENNSYLVANIA

ACCO TRADE MARK
AMERICAN CHAIN & CABLE COMPANY, Inc.
In Business for Your Safety

rural lines. R. W. Chanaberry Inc., Louisville, Ky., consultant.

Georgia

CARROLLTON, GA.—City, T. R. Luck, mayor, proposes to construct a complete sewage disposal plant costing approximately $57,000. G. Cruselle, city engineer.

TIFTON, GA.—City is making plans to construct an addition to its sewage disposal plant at estimated cost of $115,000. Wiedeman & Singleton, Atlanta, Ga., consulting engineers.

Mississippi

CLARKSDALE, MISS.—City receives bids May 2 for alterations and additions to its power plant, including coal handling and storage equipment and conversion of turbines. Available funds total $100,000. Stevens & Johnston, Starkville, Miss., consulting engineers.

North Carolina

PLYMOUTH, N. C.—North Carolina Pulp Co. plans to install electric power equipment in projected addition to local mill. Estimated total cost, $500,000.

South Carolina

SPARTANBURG, S. C. — Spartanburg water works receives bids May 8 for contract 2 in construction of additions to its filter plant. Wiedeman & Singleton, Atlanta, Ga., consulting engineers.

Missouri

LANCASTER, MO.—Tri-county Electric co-operative is receiving bids until 10 a. m., April 27, on construction of 293 miles of rural power transmission lines. Young & Stanley, Muscatine, Iowa, consulting engineers.

Arkansas

VIOLA, ARK.—North Arkansas Electric co-operative, Erbie Carroll, secretary-treasurer, has $300,000 REA allotment and proposes to construct rural electric power lines totaling about 300 miles, in three counties.

Wisconsin

MILWAUKEE — Public Service Corp. proposes to spend $1,456,000 in 1939 for improving power facilities. Included: expansion of generating capacity, construction of additional distribution lines and new substations.

OSHKOSH, WIS.—Neenah Foundry Co., E. J. Aylward, president, is ready to construct a 6500-square foot addition to its plant at cost of approximately $20,000. Project will provide new core room, casting cleaning room and utility facilities.

RACINE, WIS.—Twin Disc Clutch Co., maker of heavy duty transmission devices for tractors, has let contracts for a 50 x 70-foot addition for testing and storage.

Minnesota

LOWRY, MINN.—Village, Frank Bisek, clerk, is taking bids to 7:30 p. m., May 1, on deep well turbine pumping system, tower and tank, water distribution system and service connections. Certified check 10 per cent to accompany bid. F. P. Schaub, Glenwood, Minn., engineer.

Texas

CORSICANA, TEX.—City, Edgar Rittenbacher, mayor, plans waterworks improvements costing $125,000. Freese & Nichols, Ft. Worth, Tex., consulting engineers.

DALLAS, TEX. — Link-Belt Co. has awarded contract for a 105 x 225-foot brick and steel warehouse costing $50,000 to Morris-Quillin Co., Santa Fe building, Dallas.

EDEN, TEX.—City proposes to construct waterworks addition and sewers costing $30,000, and sewage disposal plant costing $45,000. Has applied for WPA assistance in project. Freese & Nichols, Ft. Worth, Tex., consultants.

LIBERTY, TEX.—Del Ray Petroleum Co., Tulsa, Okla., plans to build a power house in connection with its ... ral gasoline plant. Will ... air compressors, pumping mach... other equipment. Cost est... $200,000.

Kansas

CHANUTE, KANS.—City, W... art, mayor, has approved $... issue and is preparing plans ... tanks, and four chemical f... chines for water softening ... its waterworks. R. B. Reeve... gineer.

IOLA, KANS.—Jewell-Mitche... co-operative, Allen Hull, secr... tatively will receive bids A... 150 miles rural electric po... Paulette & Wilson, Salina, K... sulting engineers.

Nebraska

FULLERTON, NEBR.—Neb. ... Railway commission has ... Boone-Nance Public Power ... construct rural power lines to... miles.

OMAHA, NEBR.—United Sta... neer, City National Bank bu... accepting bids for a core dr... chine and auxiliaries to cost a...

Iowa

DUNCOMBE, IOWA — Villag... Brown, clerk, is accepting bid... p. m., May 12, on electric di... system, meters and switchboa... tified check 5 per cent to accom...

MONTEZUMA, IOWA—Voters ... proved revenue bonds for munic... er plant costing about $136,000.

Wyoming

ROCK SPRINGS, WYO.—Unio... Coal Co., Omaha, Nebr., has nea... pleted plans for a power plant ... of $500,000, including boilers ... kilowatt turbogenerators. (Not... 10.)

Pacific Coast

FRESNO, CALIF.—Certificate ... duct business under name ... moth Pipe Co., 450 North H St... been issued to the owners, Cliff... gett and O. H. Lykins.

LOS ANGELES — Ross H... Faucet Co. has been incorpora... capital of $25,000. Directors: J... Jr., W. F. Traughber and V. B... all of Los Angeles.

MONTEBELLO, CALIF.—Refi... ing & Equipment Co. has bee... to deal in oilfield materials. ... Curtis E. Long, 228 North ... street, Burbank, Calif.

SAN FRANCISCO—Pacific Can... poses to install electric power eq... in a 75 x 205-foot plant additi... ing $100,000. W. H. Ellison, Sa... cisco, engineer.

SEATTLE—Elliott Bay Mill ... West Spokane street, will cons... boiler house, turbine room and ne... at its new mill here.

Canada

ST. CATHERINES, ONT.—M... Industries is taking bids for ... 60 x 400-foot addition.

THREE RIVERS, QUE.—Hobb... Mfg. Co. Ltd., Montreal, has pu... site and will erect a plant estim... cost about $50,000.

Classified

HELP WANTED
Single Insertion—50c per line
Three to Six Insertions—48c per line
Six or more Insertions—45c per line

Seven words of ordinary length make a line.
FIRST LINE IN BOLD FACE TYPE
A box number address counts as one line.

POSITIONS WANTED
Single Insertion—25c per line
Three to Six Insertions—24c per line
Six or more Insertions—23c per line

ployment Service

ALARIED POSITIONS

$2,500 to $25,000

roughly organized advertising 29 years' recognized standing ation, carries on preliminary s for positions of the caliber bove, through a procedure indi- to each client's personal re- Several weeks are required to nd each individual must finance, ate cost of his own campaign. fee protected by refund provi- pulated in our agreement. Iden- ered and, if employed, present otected. If your salary has been more, send only name and ad- details. R. W. Bixby, Inc., 110 dg., Buffalo, N. Y.

sitions Wanted

MANUFACTURERS' REPRE- E WELL ESTABLISHED AND , WILL TAKE ON ADDITION- S NOW, SELLING LEADING REFRIGERATION AND AVIA- DUSTRIES IN THIS TERRI- DRESS BOX 891, STEEL, PEN- G., CLEVELAND.

UL SALES ENGINEER AVAIL- hort notice. Now producing in ed industrial territory. Want y for further personal develop- ecial aptitude in arc welding welding electrodes and mis- production machinery. Address STEEL, Penton Bldg., Cleveland.

MANAGER AND SALES EN- E. Heavy duty and mechanical Now contacting steel mills and irers. Desires making new con- ith A-1 concern. Salary and ddress Box 900, STEEL, Penton veland.

DUCATED EASTERN COLLEGE with 13 years' diversified experi- ars' steel industry, 5 years' in- nd mercantile experience, desires with growing company where and experience will prove of nefit. Am single and will locate Address Box 895, STEEL, Pen- Cleveland.

MECHANICAL ENGINEER EM- present desires change. Four years in machine and pattern design, iry sand control. Would prefer n South America. Can speak erman and some Spanish. Ad- 894, STEEL, Penton Bldg., Cleve-

SING AGENT. TEN YEARS buying all requirements of firm eavy machinery, both standard specials to order. In charge of d plant maintenance. Versed in foundry practice, mechanical e. Age 34, college. Address Box L, Penton Bldg., Cleveland.

G AND PROGRESSIVE SALES ative, with a successful sales desirous of representing a relia- facturer of machine screws. He a Philadelphia office, and for ten years has had close contacts engineering and purchasing de- s of the industrial trade in East- sylvania, Southern New Jersey, and Maryland. Address Box L, Penton Bldg., Cleveland.

Opportunities

ATTENTION!
MILL AND FOUNDRY EQUIPMENT COMPANIES
DO YOU GET 100% RESULTS ON YOUR SALES EFFORTS?
IF NOT
LET US REPRESENT YOU
WE ARE PREPARED TO PLACE YOUR PRODUCTS BEFORE THE BUYERS IN AN INTELLIGENT AND CONVINCING WAY.
YOU WILL GET THE BENEFIT OF OUR TWENTY YEARS' EXPERIENCE IN CONTACTING STEEL MILLS AND FOUNDRIES.
WRITE FOR FULL PARTICULARS, TO
FERDINAND G. SCHULTZ CO.
215 Questend Ave., Mt. Lebanon, Pittsburgh, Pa.

WE ARE LOOKING FOR A YOUNG MAN with technical background who is familiar with the executive buying and operating heads of steel plants located in all steel centers. He must be willing to invest at least $25,000 and make it his life work. References will be gladly exchanged. Send complete information in first letter. Address Box 902, STEEL, Penton Bldg., Cleveland.

STEEL WAREHOUSE HAS SALESMEN TRAVELING NORTHERN OHIO AND WOULD LIKE TO SECURE ADDITIONAL ITEMS TO SELL. WE ARE WELL KNOWN TO THE TRADE AND FINANCIALLY GOOD. ADDRESS Box 880, STEEL, Penton Bldg., Cleveland.

WE ARE LOOKING FOR AN ADDITIONAL account to fit in with pig iron and alloy products. We have good entree to leading iron and steel plants, particularly in Pittsburgh district. Only interested in connection of highest type. References exchanged. Address Box 901, STEEL, Penton Bldg., Cleveland.

Castings

OHIO

THE WEST STEEL CASTING CO., Cleveland. Fully equipped for any production problem. Two 1½ ton Elec. Furnaces. Makers of high grade light steel castings, also alloy castings subject to wear or high heat.

PENNSYLVANIA

NORTH WALES MACHINE CO., INC., North Wales. Grey Iron, Nickel, Chrome, Molybdenum Alloys. Semi-steel. Superior quality machine and hand molded sand blast and tumbled.

Metal Finishing

PENNSYLVANIA

PHILADELPHIA RUST-PROOF CO., 3229 Frankford Ave., Philadelphia. Electroplating; cadmium; tin; zinc; chromium; copper; nickel and silver; Anodizing of Aluminum by Alumilite process Parkerizing; Sherardizing; Bonderizing.

Equipment For Sale

No. 77½ Bliss Press 8" Str. Tie Rod.
2-A W & S Turret Lathe.
42" & 48" Aetna Std. Sheet Levelers, M.D.
48" Ryerson Friction Saw, M.D., 220/3/60.
5-ton Case Crane 65' 3" span, 220 V., D.C.
No. 5 B & S Gear Cutter, 60" x 111", M.D.
60"x60"x20' Pond Planer, B.D.
28"x64" Farrel Roll Grinder, M.D.
9/16" Type "C" Nat. Acme Aut.
42" King & 62" Betts Bor. Mills.
WEST PENN MACHINERY CO.
1208 House Bldg., Pittsburgh, Pa.

Rails—"1 Ton or 1000"
NEW RAILS—5000 tons—All Sections—All Sizes.
RELAYING RAILS—25,000 tons—All Sections—All Sizes, practically as good as New.
ACCESSORIES—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.
Buy from One Source—Save Time and Money
'Phone Write or Wire
L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

For Sale,
two 16,500 square foot HEGGIE SIMPLEX SMOKELESS STEAM HEATING BOILERS.
A. J. Felman
23 West Jefferson St., Joliet, Ill.

STEEL CLOTHES LOCKERS
SACRIFICE
Here is your opportunity for a wonderful buy. Due to an export cancellation we have acquired several thousand NEW all steel Clothes Lockers, size 12x15x66" overall, in sections of three wide, shipped erected, welded in one piece, padlock attachment only. Price $3.97 each f.o.b. New York. With Padlocks, solid base, olive green. We advise you to wire your order, for these are selling fast.
NEW YORK MACHINERY CO.
730 Sixth Avenue **New York, N. Y.**

Bids Wanted

PROCUREMENT DIVISION, Public Buildings Branch, Washington, D. C., April 14, 1939.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., May 23, 1939, for construction of the U. S. Coast Guard Air Station at Elizabeth City, N. C. Upon application, two sets of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $10 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

ADVERTISING INDEX

Where-to-Buy Products Index carried in first issue of month.

ADVERTISING INDEX

Where-to-Buy Products Index carried in first issue of month.

FOR QUICK SHEET DELIVERIES

Call the ARMCO DISTRIBUTOR

In these days of unexpected requirements and short-notice orders, you want assurance of getting sheet metal *when* you need it. You have this assurance when you do business with the ARMCO Distributor.

He stocks a wide range of sizes and gages in galvanized ARMCO Ingot Iron and galvanized open-hearth steel, as well as hot-rolled and, in some cases, cold-rolled sheets. He either stocks or can quickly get copper-bearing steel for you. Many of these alert distributors also carry ARMCO Stainless Steel in popular sizes and grades. ARMCO PAINTGRIP*— the galvanized sheet that takes and holds paint without preparation— is still another grade he can supply you.

Yet the ARMCO Distributor is known for more than his quick deliveries from stock. Often his know of sheet metal and sheet metal applications en him to be of exceptional service to his custom selecting the right metal for the right purpose. supporting him are the complete research and p tion facilities of The American Rolling Mill Com

If you are not acquainted with the nearby A Distributor, we think it will be worth your wh find out about him. Write us for this informati will only take two or three days, and you will us for introducing you to a top-notch source for metal. The American Rolling Mill Company, ecutive Offices: 260 Curtis Street, Middletown, District sales offices are located in all principal

*A special Bonderized finish.

ARMCO SHEET METAL

BUILT BY MORGAN *Engineering*

FOR STRIPPING INGOTS—BIG-END-UP OR STANDARD

is a Morgan 200-ton, Universal Screw Type er at work stripping -end-up ingots. This e will also strip stand- l-end-up ingots with- ge in the mechanism. angement it is possible to strip a mixed heat without any lost time. Efficient, rugged, dependable — such machines play an important part in stepping up steel production.

For full particulars regarding this type of stripper, please ask for Bulletin No. 30-A.

★ **DESIGNERS • MANUFACTURERS • CONTRACTORS**

★ BLOOMING MILLS • PLATE MILLS • STRUCTURAL MILLS
ELECTRIC TRAVELING CRANES • CHARGING MACHINES
INGOT STRIPPING MACHINES • SOAKING PIT CRANES

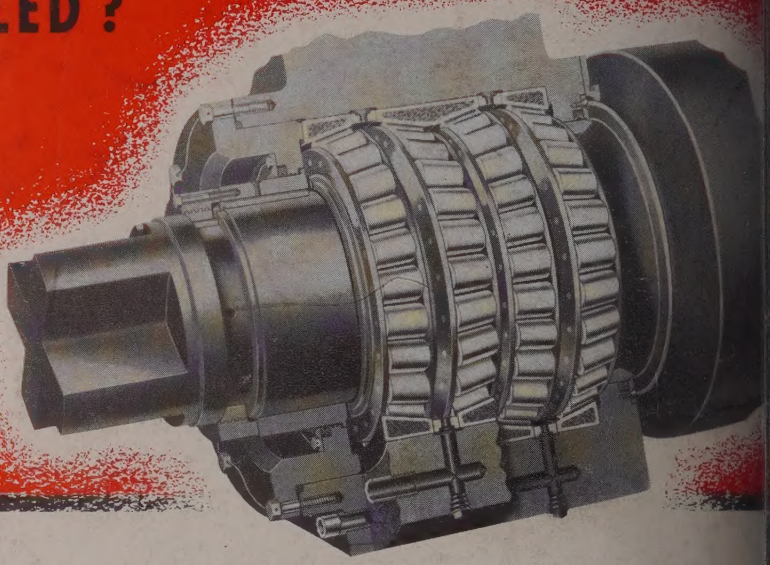
★ ELECTRIC WELDED FABRICATION • LADLE CRANES
STEAM HAMMERS • STEAM HYDRAULIC FORGING

★ PRESSES • SPECIAL MACHINERY FOR STEEL MILLS

★ **THE MORGAN ENGINEERING CO., Alliance, Ohio**

Pittsburgh, 1420 Oliver Building

WHERE ELSE COULD YOU GET SUCH LO ROLL NECK BEARING COST PER TON (STEEL ROLLED?



The price you pay for a roll neck bearing is not the true measure o your investment. That can only be determined by the length of time th bearing stays in service—by the number of tons it rolls before it become unfit for further use.

A low initial price might seem attractive, but before you buy on tha basis consider the *additional price* you may have to pay later o through interrupted production schedules resulting from involuntary mi shut-downs for bearing changes.

When you buy TIMKEN Roll Neck Bearings you buy *proved performance* and you get it at the lowest cos —based on tonnage rolled.

THE GREEN DIAMOND, Illinois Central Railroad, Speeds Smoothly On TIMKEN Roller Bearings.

GLIDE—as you ride a Timken Bearing Equipped train

TIMKEN

TAPERED ROLLER BEARINGS

THE TIMKEN ROLLER BEARING COMPANY, CANTON, O